The Canadian
Medical Association Journal

Vol. XVI TORONTO, JUNE, 1926 No. 6

An Address
ON
CARDIAC DISEASE

By Alexander McPhedran, M.D., LL.D.

Toronto

EVER since cardiac diseases have been recognized it has been the custom to describe endocarditis, pericarditis, and myocarditis as distinct entities. Investigations have shown that the muscular structure is always infected in endocardial cases, and in pericarditis the subjacent muscle is at least somewhat affected.

The late Sir James MacKenzie, in his book dealing with the heart, suggested that acute infections of any part of the heart should be considered as carditis. He gives the pregnant reason that knowledge of the full nature of the lesion will better enable us to understand the cardiac conditions when the cicatrizing process has fully produced its changes, it may be years afterwards. As the valves and the walls of the heart have a common vascular supply, it follows that even in the mildest endocardial infection the cardiac walls are always invaded by foci of infection (Aschoff bodies) which destroys the muscle fibres in the infected points; these are replaced by fibrous tissue and the power of the heart is lessened to an equivalent degree.

In early childhood, up to four or five years, cardiac infections probably always invade all the structures, with fatal results. Some years ago a child of three or four years was seen for a sick colleague. He was sitting erect in bed, face anxious, breathing rapid, fever moderate, pulse too weak to be felt, chest full especially to left, percussion note flat, and no cardiac sounds audible. He died during the night; at necropsy there was found a thick layer of pericardial fibrinous exudate over the whole pericardium, both mitral and aortic valve infected, and the muscle so much degenerated that it could be severed by firm pressure between the thumb and finger. In the child, acute infection of the pericardium and myocardium were evidently simultaneous.

We recently lost an able colleague whose pericardium was very acutely infected. Drainage was quite efficient but symptoms of infection of the heart itself soon became apparent and proved fatal.

The resistance to infection increases rather rapidly as the child grows older, as illustrated in the following instance: A girl of eight was seen after an acute rheumatic infection had abated. She was greatly prostrated, the circulation being so weak that the slightest raising of the head caused faintness. The heart was rapid and sounds very feeble, with indistinct systolic and diastolic murmurs. The outlook was grave but children should never be despaired of. It was evident that the myocardium was seriously damaged. If the head was kept low in order to aid cerebral circulation as much as possible, and as much food given as could be borne, it was hoped there was good ground for hopes of recovery; with complete rest, good nursing, cheerful encouragement, and out-of-door life, she should steadily improve. It was spring; she was taken to the country and well cared for. She was much improved when she returned home in the autumn. A thin pillow was then allowed and rest continued so as to prevent

the least overtaxing of the slowly strengthening heart. Improvement went on more rapidly than anticipated. She was kept under supervision and regularly examined to determine the progress and the degree of liberty which would be safe. As the heart grew stronger, more liberty was allowed. After about three years, her heart was deemed fully competent for reasonable freedom.

In this case the heart muscle was evidently greatly damaged, and therefore required a long period of rest to give time for damaged fibres to recover, and the destroyed ones to be replaced by the reproduction of new muscle fibres—a reproduction that would be rapid at her age. It is the rapid formation of new tissue in the growing child that forms the basis of a hopeful prognosis in many diseases in children. If given time and care it is remarkable the extensive ravages of disease that may be repaired. In the adult, reproduction of destroyed tissue lessens progressively with advancing years, so that repair of all structures and organs becomes less and less perfect with advancing age. In this child there was marked aortic regurgitation and considerable change in the mitral orifice, apparently due to slight adhesion of the segments of the valve, but there were no evidences of material obstruction to the flow of blood into the left ventricle, and respiration was not affected. The left ventricle was of course dilated, but its hypertrophy was ample to maintain perfect circulation. She attended school and took active part in all the sports and was not hampered in any of them however strenuous.

She was a charming girl and the usual results followed; she became engaged. A clear statement of the dangers of pregnancy was made to the pair, although no doubt the engagement would be carried out—it always is. Not long after, a young woman came for advice under similar, but graver conditions. She was warned of the dangers; her reply was that she would rather have a baby and die, than live longer without one.

In due time pregnancy took place and the obstetrician wished to induce abortion. This was objected to as they had been fully advised of the dangers of pregnancy, and interference seemed not only immoral but more dangerous than parturition at full time. since the heart grew stronger in pregnancy, and besides, abortion causes greater shock than parturition at full time. She was very large and gave birth to twins, and only suffered some faintness from the rapid emptying of the abdomen. A second pregnancy followed and abortion again advised and the same objection offered. The parturition took place without any trouble. In a third pregnancy, unwisely abortion was done; it was followed by a very dangerous illness. A fourth pregnancy took place sometime later and was allowed to take its course and without untoward symptoms—the experience in the third evidently led to wiser counsel. Four years later her health began to fail. Auricular fibrillation set in and could not be controlled. After some days, sudden shortness of breath occurred, followed by general œdema and rapidly terminated fatally—twenty-five years after her severe illness at eight years of age.

Had conception been prevented it is probable that health would have been maintained for some years longer. Doubtless the fibrosis of the Aschoff bodies in the left auricle, resulting from the original infection, led to the fibrillation, probably hastened by the serious strain on the heart by the numerous pregnancies.

A third case, a man about forty-five at time of death, is equally interesting and instructive. He had no recollection of having had any kind of illness in childhood. In later boyhood he had some precordial discomfort which persisted; he was then told of a cardiac murmur. He consulted a leading diagnostician in New York whose book on physical diagnosis was in vogue in my undergraduate days. He was told the trouble was congenital. I saw him some years later and found a very loud, presystolic sound occupying the whole period of ventricular rest; it had all the characteristics of a marked mitral stenosis murmur. He was very susceptible to bronchitis, doubtless owing to the persistent congestion of both bronchial and pulmonary vessels due to the mitral obstruction. Notwithstanding this he was an expert fencer and, with another expert, gave many exhibitions. He was book-keeper to a financial paper to which he gave efficient service. Later as the bronchitis grew worse the sputum became blood tinged; as time passed there was free blood. The general circulation was well maintained, the symptoms being wholly respiratory. His general condition

continued good and fencing was regularly indulged in although the sputum was increasing, and the hæmorrage grew to alarming proportions. As the heart showed no signs of failure he was reassured, and told that the hæmorrhage was necessary to relieve the tension in the pulmonary circulation. One morning some time later, he had a very copious bleeding, and a few hours later another, so large that it rapidly filled the bronchi and he died suddenly, drowned in his own blood.

At the necropsy the pulmonary artery and its branches were found greatly dilated down to the terminals, and atheromatous to an extreme degree. The ruptures through which the bleeding took place could not be found. In the heart two remarkable conditions were present. The right ventricular wall was greatly hypertrophied and very firm, resembling a moderately hypertrophied left ventricle, but there was no dilatation as the ventricle was completely emptied by each systole. The mitral valves were elongated forming a dense walled, rigid cone covered on the inner surface with a uniform layer of conical crystals closely resembling amethyst-like rock found in the Lake Superior district. At the apex the opening was not more than three or four mms. in diameter.

The cause of this remarkable condition seems quite obvious. The bronchial changes were the legitimate results of the driving force of the right ventricle against the unyielding mitral valve with its minute orifice. The inevitable result was rupture of the pulmonary arteries as the weakest link in the chain.

Although there was no history of rheumatism or other infection in early childhood, it is scarcely to be doubted that there had been repeated infections of the mitral valve with symptoms too slight to be recognized by his family. There might have been "growing pains", sore throat, or a little fever, at frequent intervals, in which the mitral valve was slightly inflamed. Such attacks recurred from time to time, in each of which the adhesion of the valves extended step by step toward the apex with gradual narrowing of the orifice. The obstruction slowly increased with the extension of the adhesion, raising the pulmonary pressure and the resistance to the right ventricle, which gradually hypertrophied as the pressure of the pulmonary blood was raised by the increasing narrowing of the mitral orifice. The infection of the muscular structures was evidently slight as it was in the mitral valves; therefore there were no symptoms of its existence, even in the left auricle which was also hypertrophied and withstood the great strain of the high pressure in the pulmonary circulation, otherwise auricular fibrillation would have occurred.

The calcareous deposits in the mitral cone probably began fairly early and continued to the end. In fact all the changes probably began in early childhood and were slowly progressive.

Both cases emphasize the importance of early recognition of even the slightest symptoms, especially fever in children, and, of guarding in all cases against recurrence of and progressive damage to the valves. For this purpose prolonged confinement to bed, until there is complete recovery from the infection is of the utmost importance. Once infected, the valves become less and less resistant to each recurrent infection.

The second case illustrates the benefit of regular, vigorous exercise in developing and maintaining the strength of the heart and enabling it to cope with the emergencies of the future. If the mitral orifice had been less narrowed the man might have attained an old age of usefulness. Had the ventricle been less powerful he might have lived as long but he would have been invalided by failing circulation long before his death.

These two cases emphasize the importance of accurate histories as guides to treatment, as well as in estimating the anatomical changes, as on these the prognosis depends. In the woman's case, auricular fibrillation seemed the inevitable termination, as fatal hæmorrhage was in the man. Such studies offer a wide field for *clinical research*, and they are the legitimate field of the general practitioner; no one else can carry it out so effectively.

An Address

ON

THE FUNCTIONS AND LIMITS OF SPORT IN EDUCATION*

By R. Tait McKenzie, M.D., LL.D.

Professor of Physical Education, University of Pennsylvania

IT is a surprising but true statement that in practically all tests of skill and endurance the highly civilized man surpasses the savage. He can jump farther and higher, run faster and farther, shoot straighter, and, in addition to these has the ability of combining, in the form of games, that spirit of self-effacement and co-operation which is the foundation of all community life. This physical intelligence is just as valuable now as it was when men had to use their trained muscles in the struggle for survival, and no matter how artificial the conditions of our lives may be its value will always remain the same.

It is physical intelligence that saves the broken arm or the sprained wrist in one who has learned to keep his feet on the slippery pavement, or failing that, who has learned to fall without hurting himself; a feat that is taught only in games. Costly lives have been lost from the inability to swim; an accomplishment that takes but little effort to learn; from the inability to jump, to climb or to dodge, and the training of these abilities is the basis of practically all games that have survived the test of time.

The child begins his education by a play system of his own, beginning with simple conditions and work movements. He accustoms himself to his surroundings, learning to judge distance, time and resistance. As his nervous system develops he begins to test himself against his fellows. Movements that at first required his entire attention, like the attainment of the standing position, become relegated to lower levels, leaving his brain free to acquire new and more complicated combinations of movement. He begins to test himself in speed, and to create games of tag, which develop into football, baseball, hockey and lacrosse. Aimless tugging, and striking develop into the form of contests in boxing and wrestling, and the aimless running and jumping become the highly specialized contests of the track and field. As the nervous system develops still further he passes on to the games involving co-operation as well as greater skill.

It is a curious thing to see how each of these three classes of activity persist. The child climbing a fence becomes the small boy balancing himself on top of it and then the skilled gymnast balancing himself on the unstable trapeze. The choosing of sides by children in a tag game like "Prisoner's Base," develops into the rigid organization of the football team, in which every player has his place, and in after life into the highly specialized organization of modern commerce.

Why does a child play marbles and spin tops at certain seasons and ages only?

There is no hygienic reason why a boy of twelve should not play golf or fence, but with rare exceptions he will not do so. They are upper level games. Why does an adult not enjoy building block houses and the activity of the sand pile? They are lower level games, and it is this evolution of the nervous system in which simple activities are relegated to the lower level to make way for new accomplishments that makes for progression in physical education just as indeed it does in all education. This has been recognized among all highly civilized people.

The Athenians with their day schools, spent half the time in physical exercises. The Spartans, with their highly organized boarding schools, spent almost all of it in training their bodies to protect their liberty. The English public schools have always recognized the

* Paper read before the National Congress on Education and Citizenship, Montreal, Friday, April 10, 1926.

necessity of making games an important part of their day's programme, and the preparatory school in America has done the same thing. It is only when education has been extended to the mass of the people, that difficulty of taking care of their physical development has been actually felt.

The great war has again brought this question to the fore, and the remarkable improvement in the physique of men under proper hygienic conditions, and active exercises showed that even at a late stage of growth defective development could be greatly changed for the better.

All over America, State after State has passed laws making physical education part of their school system; but too often physical training becomes a sham, and a byword consisting of setting up exercises a few minutes in the day. If it is to have any real effect on the growth and development of children it must be a question of hours and not of minutes, and the only way in which this can be accomplished is by supervision and direction of their athletic sports.

The true function of athletic sports in education then is, first of all, to train the growing child according to his physiological age, in those activities that are proper to that age. If this training is missed it is very difficult to pick it up later on. A child who has learned to swim does not need the elaborate and prolonged instruction necessary to one who takes it up when full grown, and if training in running and jumping, throwing and catching is not acquired in youth it is hard to learn the finer co-ordinations in middle life, as every middle aged golf beginner knows.

The function of games is not only the cultivation of skill, important as that undoubtedly is. The body requires constant movement supplied only by the practice of some form of physical exercise for its normal growth. Without some regular form of activity the muscular system will be starved, the bones delayed in their development, and the brain, which has so much of its grey matter occupied in looking after muscular movements, will be retarded in its development which can be brought about only in that way.

Without the relief given by movement nervous tension is increased, especially under the conditions we live in, surrounded by telephones, radio, motor cars, and other devices that stimulate our emotional life, and call more and more on the mental centres of the brain for attention.

Athletic sports also have their ethical value in education. The cultivation of physical courage is of the first importance. The banishment of the fear of deep water, of vaulting over an obstacle, of standing up against an opponent, all strengthen the character, and the ability to endure pain and exhaustion is not to be lost sight of in this age of luxury when the tendency is to make things easy.

Many children first learn their proper place in community life only through games. In this way they learn loyalty, not only to their team, but to their school and college, and to the country in which they live.

Certain limitations to the place of athletic sports in an educational system must be recognized, but these limits are almost all due to the abuse rather than to the proper use of them.

The hygienic dangers are due for the most part to the intense competition, and the forcing back of contests that are suitable to young men of twenty, into the schools for boys of sixteen is an example of what I refer to. There is real danger in having boys of that age run half mile or mile races, and many a promising athlete has had his career crippled by over enthusiastic competition in his school life, when a little care and restraint would have prevented it.

This is especially true among women. At the present there is a movement to encourage public competition among girls in contests that are essentially designed for boys and men. If left to themselves girls will not, as a rule, practice the same sports, and the making of a long schedule of inter-institutional competition for girls in schools and colleges is a tendency entirely in the wrong direction.

In athletic sports, as in life, severe competition finds following it as a shadow, the danger of cheating, dishonesty and commercialism. This is especially true at the present time in American college athletics, where the tremendous interest in football has put vast sums of money in the hands of those who direct them. The answer to this is, I believe, not

the abolishment of these contests but rather the careful administration of the money by a responsible authority. It is a new condition and must be met in a new way.

In conclusion, I believe that progressive physical education, largely by means of supervised athletic sports, is an essential part of our educational system from infancy to maturity. That it should be taught and closely supervised, and that it should have similar credits and penalties to other subjects on the curriculum. That success in it should be valued as highly as the rest of the educationalist's programme was recognized by Cecil Rhodes in his award of scholarships at Oxford. I believe that it has an educational value which nothing can supplant, and that any educational system that slights or ignores the physical development of the pupil is not only partial and incomplete but fails in one of its most important missions, and I believe that such dangers as may accompany its administration can be controlled by proper supervision and organization.

An Address

ON

INFECTIONS OF THE BILIARY TRACT*

A Stock-taking of Diagnosis and Treatment

By A. T. Bazin, D.S.O., M.D.

Professor of Surgery, McGill University, Montreal

ONE of the most important points in presenting a paper before a mixed audience such as this is the choice of subject. I have selected biliary infection because it is of interest to physician and surgeon alike, and because I believe it is often allowed to progress, undetected and untreated, until conditions may become critical or irreparable. Because I also believe that surgical treatment is sometimes inadequately carried out, falls short of the requirements of the individual case, and hence does not relieve the symptoms.

In appraising the value of symptoms in order to determine a diagnosis one must of necessity consider the physiology of the organ or parts affected as also its pathology—or deranged physiology. In applying this principle to infections of the biliary tract and conditions arising therefrom or associated therewith, we are confronted with the difficulty that we have no complete knowledge of the physiology of either the liver or the gall bladder. With our incomplete knowledge, however, we have adopted a working hypothesis which may or may not require modification as our knowledge becomes more complete. We are prone to assume that infection of the biliary tract first locates in the gall bladder, and gives rise therein to certain alterations in structure and function as well as to the formation of calculi; that other portions of the biliary system both intra- and extrahepatic become secondarily involved, as do also other organs which are intimately connected anatomically and functionally. That this assumption is in the main correct is borne out by clinical experience, but that it does not universally apply must be kept in mind, otherwise treatment will be inadequate in a considerable number of cases.

Infection may reach the biliary system through a number of channels. 1. *Up the duct from the duodenum.* This is probably a very rare occurrence. The healthy duodenum contains no organisms. Stagnation in the flow of a secreting gland is required before infection can pass upstream, and this stagnation follows upon, and is due to, the effects of infection. Therefore this path can be almost thrown out of court.

* An address delivered before the Toronto Academy of Medicine, April 6, 1926.

2. *Through the lymph stream.*—An unhealthy and infected duodenum or pylorus with lymphatic extension (retrograde) into the lymph nodes of the gastro-hepatic omentum, and of the gall bladder, and continuing into the submucous lymph channels may be a path. Or again, an infection in the liver may through the rich lymph anastomosis in the sulcus of the gall bladder pass from liver to gall bladder.

3. *Through the portal circulation.*—(a) Lesions in the gastro-intestinal tract, in the appendix, or in the small or large intestine, with infection therefrom of the portal blood. (b) Failure upon the part of the spleen to entirely detoxicate under stress the blood which passes to it, and permitting the passage of infecting agents into the portal blood. Infected portal blood passing into the liver may find that organ unable to sucessfully cope with and destroy all the infection, which may thus get into the bile and in this way infect the gall bladder and other biliary passages. An argument in favour of this theory may be found in the frequency with which splenic diseases are accompanied by signs of gall bladder infection with or without gall stones.

4. *Through the systemic circulation.*—This is undoubtedly the usual path. The original focus of infection may be nearby or distant and any infecting organism may be harboured, although there seems to be a predilection for streptococci and the enteric group (typhoid and colon bacillus). This metastatic infection may be confined to the gall bladder, or may be diffused throughout the biliary system both intra- and extra-hepatic.

What then are the symptoms of such an infection and its results? What are the signs, and by what means can they be elicited? At times an infection with acute inflammatory reaction may attack a previously healthy gall bladder, as during the course of a typhoid fever. But usually an acute cholecystitis is an *accident* supervening upon a chronic cholecystitis. Similarly a gall stone colic must be considered as an *accident* developing because of pre-existing chronic inflammation.

It is not my purpose to deal with these crises. They speak for themselves and in no uncertain voice. It is to the whisper of the antecedent condition that we must give close ear, not because of an academic scientific satisfaction to be derived from such a study, but because the crises above mentioned as well as others (such as pancreatitis) are a menace immediate or remote, to the life of the individual. If this menace is to be removed the crises must be avoided.

By what means then can we reach a diagnosis?

1. *By the law of averages.*—Our predecessors have furnished us with statistical records which show that fat, flatulent females above forty, and particularly those of unusual fecundity are the especial victims of gall bladder disease. It must not be forgotten, however, that biliary infection may be present in males, in individuals of both sexes who are not fat and in those much younger than forty.

2. *By the history.*—In most instances there is a long history, ten to fifteen years of symptoms more or less distressing. Frequently these symptoms date their onset definitely from some infective illness, as typhoid or influenza; or to a pregnancy during which there was evidence of pyelitis, a colon bacilluria. These complaints are those of the chronic dyspeptic, and are frequently of such light degree that home remedies only are applied; a choice of dietary dictated by experience, together with the use of baking soda, or peppermint-tea. But the chronicity of the complaints usually drives the patient to seek medical advice, and it should not be sought in vain. Careful analysis of the history and the complaints will determine the following points: distress—not always pain—is felt in the epigastrium and right hypochondrium sometimes passing through to the back and radiating to one or other scapular region, usually the right. This distress is accompanied by a sense of fullness, of smothering, of flatulent distension, and is partially relieved by eructations of gas.

The onset is shortly after *every* meal, it may be *during* the meal interrupting its completion. The distress is greater after a heavy meal, or after certain articles of diet, such as the pickles, pork and pastry of a former teacher. There are no periods of relief as in peptic ulcer, whether gastric or duodenal. For 365 days in the year the gall bladder dyspeptic has distress. The distress is not relieved by lying down, thus differing from that other chronic dyspeptic condition, gastroptosis, in which the symptoms appear toward the end of the day and are relieved by lying down. It may be that during the course of the disease there have been one or more acci-

dental crises; a gall stone colic, or an acute or subacute cholecystitis.

3. *By physical examination.*—The signs are few—sometimes none. In this stage of the disease the gall bladder is seldom palpably enlarged. It may be tender however, but so deeply placed under the overhanging liver that this tenderness is hard to elicit. Murphy's manœuvre should be used, *i.e.,* sinking the fingers deeply into the right hypochondrium while the patient draws a long breath forcing down the liver and crowding the gall bladder against the fingers. This when positive is known as Murphy's sign. During this manœuvre the edge of the liver may be palpated; the organ is frequently enlarged and tender, and the seat of a mild hepatitis indicative of a diffuse biliary infection.

Mayo Robson's point is situated midway between the right 9th costal cartilage and the umbilicus. Deep, one finger pressure at this point frequently reveals sharp tenderness and according to the author of the test indicates gall bladder inflammation. The explanation of this tender spot is far from clear. The spot is situated over the head of the pancreas and by some is ascribed to an associated pancreatitis. My own view is that the lymph glands about the head of the pancreas and which drain the gall bladder area are inflamed and tender. Or it may be a manifestation of deep or muscular segmental hyperæsthesia.

Segmental hyperæsthesia and referred pain.—Head in 1893 established upon clinical evidence that the gall bladder receives a sensory supply from the 8th and 9th thoracic segments of spinal cord and to a lesser degree from the adjacent segments. The path of afferent impulses (sensory) from the gall bladder would thus be through the hepatic and cœliac plexuses, the splanchic nerves to the sympathetic chain, thence by the white rami communicantes of the 8th and 9th thoracic nerves to the spinal cord. The "referred" irritability resulting in referred pain and areas of hyperæsthesia, superficial and deep, would be passed along the branches of distribution of the 8th and 9th, possibly 10th thoracic nerves, both posterior and anterior primary divisions. The posterior branches descend prior to reaching the skin, hence the area of skin hyperæsthesia is opposite the 9th and 10th dorsal spines. The anterior primary divisions encircle the body and terminate in front between the epigastrium and umbilicus. A zone of hyperæsthesia may thus be determined extending from the midline in the back to the midline in the front, and is the explanation of Boas's sign (confined to back), epigastric tenderness, and Robson's point, Boas's sign being an instance of superficial hyperalgesia and Robson's of deep or muscular hyperalgesia.

In my own experience Boas's sign is seldom present, whereas a tender epigastrium and Robson's point are of very great diagnostic aid. The nerve distribution also explains the incidence of pain referred to the scapular region especially in cases of biliary colic. This is loosely and erroneously described as pain referred to the shoulder and must not be confused with the next item.

Phrenic nerve reflex.—This is a moot point as a sign in gall bladder disease Years ago Ferguson of Toronto established, upon experimental and clinical evidence, that the phrenic is a mixed nerve, sensory as well as motor, but there is no direct anatomic evidence that the phrenic nerve supplies the gall bladder or biliary passages. Gray describes phrenic branches to the falciform and coronary ligaments of the liver, and Cunningham states that the hepatic branch of the right phrenic communicates with the cœliac plexus, and through this gives off branches to the hepatic plexus. Reliable clinical authorities who unequivocally declare that the right phrenic supplies sensory branches to the gall bladder are Sir James MacKenzie (Symptoms and their Interpretation) and Beesly and Johnston (Surgical Anatomy). The path of referred pain to the shoulder is along the distribution of the cutaneous branches of the superficial cervical plexus from the 3rd, 4th and 5th cervical segments—*i.e.* the supra-sternal, clavicular, and acromial nerves,

No such well marked referred pain to this area is noted in gall bladder disease as in the definite "phrenic reflexes" which occur in diaphragmatic pleurisy, sub-diaphragmatic abscess or ruptured spleen. Tenderness of the trunk of the phrenic nerve in the neck (De Mussy sign) presupposes a definite ascending neuritis of the nerve. I have never been able to satisfactorily demonstrate this sign, nor can I understand why the phrenic nerve trunk

should develop a neuritis because a few of its terminal filaments supply an area of mild infection.

4. *Gastric analysis.*—Inasmuch as the complaints are largely dyspeptic it is presumed that a certain number of these cases will be submitted to analysis of gastric contents. It will be found that there is a diminution of total acid and frequently an absence of free hydrochloric acid. But this examination is so liable to error even in organic disease of the stomach itself, that it has justly fallen into a position of inferiority.

5. *X-ray evidence.—Direct.*—1. Gall stones. The percentage of positive findings varies according to the technique and to the composition of stones. Cholesterin stones throw no shadow. Stones high in calcium content throw a clear shadow. The vast majority of stones are composed of a variable mixture. Possibly there are 50 per cent positive findings. 2. Gall bladder shadow; indefinite, definite, or very definite in the cases of calcified wall. 3. Visualization of the gall bladder by means of sodium tetra-brom-phenolphthalein, or sodium tetra-iod-phenolphthalein. This method of Graham and Cole, confirmed and elaborated by many others, depends upon the power of the healthy gall bladder to concentrate the drug which is excreted in the bile to such a degree as will render it opaque to the x-rays. If the bile does not enter the gall bladder because of a block in the cystic duct, or if the gall bladder mucosa has lost its function of concentrating the bile, no normal shadow will be seen. In other words a positive finding indicates a normal gall bladder.

A standardized technique must be carefully followed, but the details vary in different clinics. In some the x-ray department is run on a 24 hour service and films are taken 4, 8, 24 and 32 hours after administration. This elaborate system is probably unnecessary. The plan we adopt is to administer the drug intravenously at 6.30 p.m. The first x-ray is taken at 9.30 a.m. and followed by a light breakfast. The second x-ray at 12.30 p.m., and a third at 4.00 p.m. The iodine salt is used exclusively as its greater atomic weight permits of smaller dosage with lessened toxic disturbance. The intravenous method has every advantage over the oral exhibition as the latter is inconstant in its results. In practically every case there is considerable disturbance of the patient, headache, nausea and vomiting, but the results are, on the whole, reliable and satisfactory and in cases otherwise difficult of diagnosis, the procedure is well worth while.

Indirect evidence.—1. With the opaque meal other lesions giving rise to dyspeptic symptoms may be eliminated: *viz*, gastric or duodenal ulcer, gastric carcinoma or visceroptosis. 2. With absence of evidence of organic lesion in stomach or duodenum, the behaviour of the stomach may point to an extra-gastric irritative lesion as evidenced by hypertonicity, hyperperistalsis, or spasm of the pylorus. 3. An enlarged gall bladder pressing upon the pyloroduodenal region may show a persistent concavity in the shadow of this region. 4. Contracted adhesions between gall bladder and pyloroduodenum may produce irregular contraction deformities in the latter, or the inflammatory mass of pericholecystitis may show filling defects simulating malignant disease of the pylorus.

6. *Urinalysis.*—So much stress has been laid upon the presence of bile in the urine as a diagnostic sign of gall bladder infection it is wise to consider this point rather fully. A positive finding is of very definite help, but a negative finding is of no value whatsoever. In chronic cholecystitis positive findings are extremely rare and indicate rather a more widespread biliary infection, *i.e.*, hepatitis. Even in acute cholecystitis or sudden blocking of the cystic duct by stone or by inflammatory reaction the presence of bile in the urine is of but short duration, and is due to two conditions. First: The gall bladder being filled with bile at the moment the cystic duct is blocked, the contained bile will be absorbed into the blood stream, and excreted through the urine. When all of this bile is absorbed, the blood stream and the urine will again become clear. This is a matter of but a few days.

Second: In a very acute cholecystitis, there is extension of inflammation to the adjoining area of liver; a local hepatitis with cholangitis and blocking of bile capillaries. The bile secreted from this area cannot escape into the biliary passages, and is absorbed into the blood stream. Hence bile appears in the

urine until such time as the local hepatitis subsides.

Closely associated with this urinary test and due to the same cause, *i.e.*, bile in the blood, the observance of an icteroid tinge in the sclera has the same value and significance. But more delicate still is the *Blood chemistry.*—Some days before icterus can be detected by the eye the blood will show the presence of bilirubin. This is the Van den Bergh test and its only value in these conditions is the gaining of time, or the detection of such slight blood contamination as would escape observation in urinalysis or tissue staining.

Blood sugar: sugar tolerance.—The anatomic relations between the biliary tract and the pancreas are so intimate, by the ducts, by the lymphatics and by the vascular distribution, that disturbance of one is associated with disturbance of the other. Gross anatomical changes in the pancreas are late manifestations of disease in that organ, whereas functional disturbances become evident very early. The pancreas produces two secretions, the external and the internal. The external aids the digestion of the food in the intestinal canal and has a very large reserve capacity inasmuch as a considerable proportion of the pancreas can be destroyed without interfering with the digestive function. But the internal secretion which determines carbohydrate metabolism has apparently very little reserve capacity as the slightest damage to the organ interferes with carbohydrate metabolism and is evidenced by hyperglycæmia, if not by glycosuria.

The diagnostic significance of hyperglycæmia in infections of the biliary passages becomes evident when I quote from Rabinowitch on a series of cases observed in the Montreal General Hospital—"Hyperglycæmia was found in 75 per cent of all cases of lesions of the biliary passages."

There is still, however, the 25 per cent negative findings to explain. The test for blood sugar is done with the patient in the fasting or post-absorptive state, and under these favourable conditions mild disturbance in carbohydrate metabolism might not be detected. These patients were therefore subjected to the sugar tolerance test and in another series of twenty-four with no hyperglycæmia twenty-one showed diminished tolerance, with or without delayed assimilation.

The Meltzer-Lyon test.—This consists of the passing of a duodenal tube and injecting into the duodenum a 25 per cent solution of magnesium sulphate. This causes the sphincter of Oddi to relax and bile pours down from the ducts and gall bladder. This bile is withdrawn through the duodenal tube and subjected to chemical, cytological and bacteriological examinations. The method is not sufficiently informative for the trouble it occasions and may be abandoned both for diagnosis and especially for treatment.

To pass on to consideration and evaluation of methods of treatment: medicine and dietetic treatment may be palliative but not curative, even in the absence of stones. Operative procedure then is indicated and should be done as early as possible in order to prevent the dangerous crises of acute cholecystitis, obstruction of the common duct, septic cholangitis, pancreatitis or even the later development of *diabetes.* I mention diabetes advisedly. Time does not permit of thoroughly presenting the arguments in favour of biliary infection being one of the etiological factors in the later development of diabetes. It is well recognized that acute pancreatitis is usually, if not always, associated with infection of the biliary tract, and that chronic pancreatitis disappears with surgical drainage of the biliary tract. The number of reported cases in which diabetes has followed acute pancreatitis is rapidly increasing, eight such have occurred in the Montreal General Hospital in the past five years with an average interval of 26 months from the date of the pancreatitis to the detection of the diabetes.

I have already referred to the value of determining pancreatic dysfunction (hyperglycæmia or diminished sugar tolerance) as an aid in diagnosing biliary infection. The converse of the picture is also highly suggestive. In a relatively high percentage (26) of cases of diabetes the Van den Bergh test indicated deficient liver function. Properly controlled by careful clinical observation these studies may result in the conclusion that early and thorough treatment of biliary infection may prevent the development of diabetes or may halt further damage to the pancreas.

I cannot labour the subject further, but would refer you especially to the work of Jones and Associates (Joslin Clinic) (*Archives Internal Medicine*, 1925, xxxv, p. 315), who in cases of diabetes studied the bile pigments as withdrawn from the duodenum; and to that of Rabinowitch in the Montreal General Hospital (to be shortly published in the *British Journal of Experimental Pathology*) who has utilized the Van den Bergh test in the study of 130 diabetics and 254 controls.

It is not my intention to review in detail the operative technique to be employed, but in a few words would like to state the axioms which govern my own procedure.

First.—Remove all other foci of infection.

Second.—When the biliary infection is apparently limited to the gall bladder, I advise cholecystectomy and closure of the abdomen without drainage.

Third.—When there is any evidence of a more diffuse infection, *i.e.*, engorgement or enlargement of the liver, thickening or dilatation of the extra-hepatic ducts, induration or enlargement of a part or the whole of the pancreas, I advise cholecystectomy with, in addition, drainage of the common duct.

Fourth.—After carefully establishing by exclusion and direct methods that infection of the gall bladder is presumably the cause of symptoms: and after opening the abdomen and finding a normal appendix, stomach, pyloro-duodenum, pancreas, liver and bile ducts, with absence of adhesions, and to the casual observer a normal gall bladder, what then? I still advise cholecystectomy, in spite of the criticism of the bystander who is frequently the referring physician.

The signs of early or slight infection of this organ are subperitoneal deposit of fat, especially along the lines of the vessels in the wall; and, still more important, palpable lymph glands in the gastro-hepatic omentum, or on the neck of the gall bladder.

To these simple rules there are of necessity exceptions and modifications which are governed by the condition of the patient. The only rule which is paramount is that the primary indication of any treatment is to save life.

Summary

1. I have attempted to inventory in brief form the signs and symptoms of chronic biliary infection and to assign to each its peculiar value in reaching a diagnosis.

2. I trust I have emphasized the causative relation between the comparatively innocuous condition of chronic biliary infection and the development of serious acute crises or of incurable disease.

3. Further study of hepatic and pancreatic function may lead to the conclusion that the early eradication of chronic biliary infection will lessen the incidence of diabetes.

In conclusion I wish to express my grateful appreciation to Dr. McLaren Thomson of the Department of Anatomy, McGill University, for valuable assistance.

Puerperal Fever.—The production of a toxin by *Streptococcus hemolyticus* isolated from the blood of patients with puerperal fever has been demonstrated. A comparison of the incidence of the skin reactions of the toxins from hemolytic streptococci from puerperal and scarlet fever was made by Abraham F. Lash, Chicago, in 247 women, non-pregnant normal, normal pregnant and normal puerperal. Thirty-one women had a positive Dick test and thirty had a positive puerperal toxin test. Eleven were positive to both tests. The low incidence of scarlet fever from the history of the pregnant and puerperal women is probably due to inherent immunity in this type of patient (at the Cook County Hospital) or to only slight attacks of scarlet fever which, though sufficient to immunize, were not severe enough to be noticed. The history of puerperal fever would have been of no value, as many organisms as well as different strains of streptococci may cause it. Again the low incidence of positive Dick and puerperal toxin reactions can be explained by the natural immunity of the patients. The reactions of the two toxins in the same persons would indicate that a person may be immune to one strain of *Streptococcus hemolyticus* but not to another.—*Jour. Am. Med. Ass.*, May 8, 1926.

A SIMPLE AND ACCURATE METHOD OF DETERMINING BASAL METABOLIC RATES*

An Electrometric (Katharometer) Procedure

By I. M. Rabinowitch, M.D.,

Assistant Professor of Medicine and Lecturer in Biochemistry, McGill University, Montreal

and Eleanor V. Bazin

Clinical Research Laboratory, Montreal General Hospital

BASAL metabolic rate determination has become a common procedure in well established clinics. The possible applications of this laboratory test are becoming more generally recognized. The two great factors, however, which tend to limit its usefulness are difficulties in the interpretations of results and the necessary technical procedures. In a hospital with a fairly large routine, sufficient data accumulate in a very short time which demonstrate the numerous vagaries of basal metabolic rate determinations. The information sought by clinicians is the *basal* metabolism, and there are many factors which tend to make conditions other than basal. The basal character of metabolism is a very fundamental phenomenon, and contrary to the view generally held, not very readily obtained. The principal pre-requisites are more than the absence of fever, abstaining from food and a short preliminary rest period. Failure to recognize these other pre-requisites, particularly those appertaining to psychic and environmental conditions, makes this test more than useless; its results may mislead. Since the information which the clinician seeks is the *basal* metabolic rate, and in view of the above observations, it may be stated that, contrary to the statement of makers of apparatus, this test is not yet, at least, in the majority of cases, an "office" procedure.

Assuming fulfilment of all pre-requisites, the necessary technical details are to be considered. It may be said, generally, that *the degree of usefulness of any laboratory test, clinically, is directly proportionate to the simplicity with which it can be carried out.* The methods now in use are generally known and require no detailed description. For very accurate work, and conditions associated with marked alterations of respiratory quotients, a Tissot gasometer or a Douglas bag and meter, and gas analysis apparatus are required. As is well known the method is "open". The subject inhales outside air and the expired air passes into the gasometer or bag. For ordinary work, such as measuring the progress of patients with hyperthyroidism, and other conditions not associated with marked fluctuations of respiratory quotients, apparatus which determines the rate of oxygen consumption only, suffices. The apparatus for this purpose is usually built on the "closed circuit" principle. From the patient's point of view—a very important one—the "open" methods, at least in our experience are preferable. We have performed a large number of tests by both methods in this hospital, and this statement is based upon the observations of many patients who have been tested with both types of apparatus. Such subjective symptoms as "fullness in the head", "headache", "difficulty of breathing" are met with less frequently when the patients receive "outside" air than when they receive pure oxygen. With our present knowledge, there may be no apparent physiological basis for this difference, but the fact remains that it exists. The chief objections to the open methods, however, are that they are time consuming and demand highly skilled gas analytical work.

Because of the foregoing facts, a more simple procedure, but one retaining the "open" principle, has been sought, and the purpose of this communication is to record the results of an electrometric method. It will be shown that *simplicity has not been obtained by the sacrifice of accuracy.* Basal metabolic rates, with this method, are calculated from the rates of carbon dioxide production, determined by means of a

* From the Department of Metabolism, Montreal General Hospital, Montreal, Canada.

katharometer. A few brief remarks are necessary with reference to the use of the rate of carbon dioxide elimination as an index of the rate of metabolism.

King[1] has shown that basal metabolic rate determination, by measuring carbon dioxide elimination, is a reliable procedure. Statistical and experimental results agreed. The deduction made by Raymond Pearl, from a statistical treatment of direct calorimetry data, was that the results of the measurement of oxygen intake were not more highly correlated with the results of direct calorimetry than were those of carbon dioxide elimination. One objection which may be made to carbon dioxide measurements is that in conditions associated with marked fluctuations of respiratory quotients, (such as in diabetes), carbon dioxide production does not parallel heat elimination as closely as oxygen consumption does. This objection is valid, and the use of the method described here is for this reason limited. Such conditions, however, represent the minority in which basal metabolism studies are usually made. The chief objection which may be made, is the well known fact, that individuals may, temporarily, store carbon dioxide, and wash it out during a period of over ventilation while the test is proceeding. It might be recalled that under the conditions of a basal metabolism test, muscular activity is reduced to a minimum. Respiration rate, ventilation rate, lactic acid formation, etc., therefore tend to be at a minimum also. King has shown that the amount of carbon dioxide washed out during the average test period is not of sufficient magnitude to affect results. This observation has been confirmed in our clinic in a large series of cases. Positive proof of the correctness of this view will, however, be shown presently, since by means of the katharometer, it is possible to observe, accurately, the amount of carbon dioxide eliminated, from minute to minute, throughout the entire period of a test. Another observation by King, and worthy of note, is that the tendency to high results, that are not supported by clinical evidence in cases of hyperthyroidism, is considerably less with carbon dioxide measurements than is indicated by the reports of work done by either the Tissot or closed circuit oxygen methods. King's procedure is well known. Briefly, carbon dioxide eliminated is absorbed by soda lime and quantitatively determined by increase in the weight of the absorbing material.

Principle of New Method, The Katharometer

This apparatus makes use of the physical property of heat conduction of different gases. The electrical system is arranged in a Wheatstone bridge circuit, in the course of which there is a galvanometer, G, as shown in the following diagram.

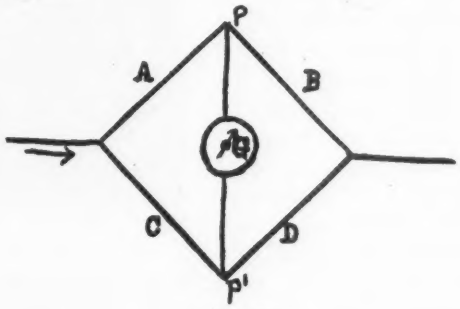


Fig. 1

The four branches, A, B. C., and D, are made of platinum and so arranged that A, D, and B, C, are enclosed in separate chambers. The chamber enclosing A and D contains air, and, through that enclosing B and C, the experimental gas, containing carbon dioxide, is made to pass. Since the heat conductivity of carbon dioxide is about forty per cent less than that of air, the heats generated in the platinum wires A and C, from the passing electric current, are conducted away at unequal rates, (more slowly from A than from C). The resultant increase in temperature of branch A increases the resistance of the wire. The potentials at the connecting points p and p^1 of the galvanometer are thus altered, and, other conditions being kept constant, the degree of deflection of the galvanometer needle becomes a function of the concentration of carbon dioxide in the experimental gas.

This principle was first employed in 1915 by G. A. Shakespear of Birmingham, for the testing of the permeability of balloon fabrics* during the war and for the purity o fgases. It was then developed by the Cambridge Instrument Company of England, for the determination of CO_2 in flue gases.† A. V. Hill[2] of Manchester then

* For the Board of Invention and Research of the British Admiralty.

† The instrument made use of in the present work was made by the Cambridge Instrument Company, of London, England.

applied it in his physiological researches on alveolar air. So far as could be ascertained from the literature no attempt has been made hitherto to apply it to basal metabolic rate determination.*

The theory of the katharometer is described in detail in the proceedings of the Royal Society of London (Series A, vol. 97, p. 273), by Dr. H. A. Daynes of the University of Birmingham. A more diagrammatic representa- of the general plan of such apparatus was found in a recent number of the *Chemical and Metallurgical Engineering Journal*, (vol. 29, p. 248, 1923) in a description of a flue gas tester. This is shown in Fig. 2. It will be seen that the current

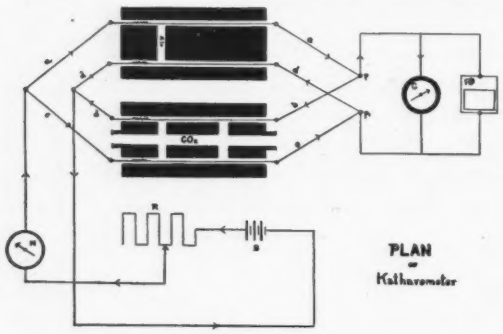


FIG. 2

from a battery, B, controlled by a rheostat, R, passes into a Wheatstone bridge circuit, the upper branch of which, A, passes through an air chamber, and the lower, C, through the chamber containing the experimental gas. At the galvanometer connecting points, p and p', the continuations of these branches are so reversed as to allow the continuation of the upper branch, B, to pass through the CO_2 chamber, and that of the lower, D, through the air chamber. In addition there is a recording galvanometer, rG, for automatic readings.

* We are indebted to Professor A. V. Hill for having brought to our attention, in a personal communication, the only reference to the use of this principle in physiological work.

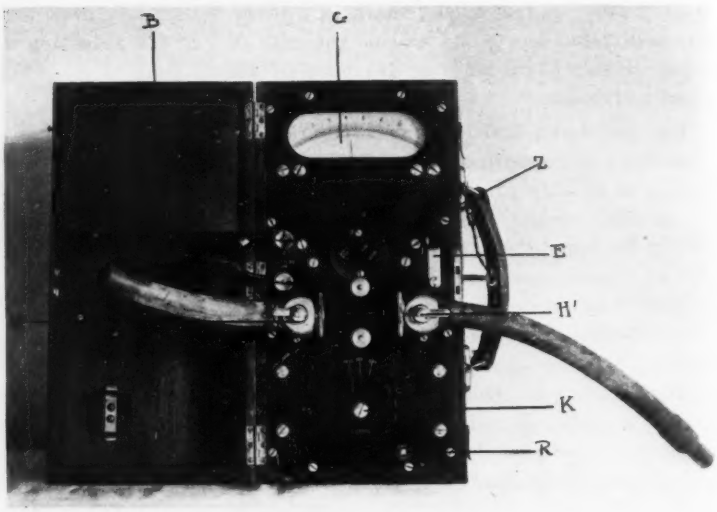


FIG. 3

A photograph of the katharometer used in our work is shown in Fig. 3. Its dimensions are 13 in. x 7in. x 5½ in. and it weighs about fourteen pounds. The whole outfit is contained in a portable case with carrying handle.

METHOD OF DETERMINING CO_2 CONTENT OF A GAS

The indicator on the galvanometer scale, G, is first set at the zero point by means of the adjusting screw, Z. The positive and negative terminals of the battery, B, are then connected with their corresponding posts (+ and — as shown in the figure). The dial, K, is then turned in the direction so that the arrow upon it is on the line marked "test". The circuit is completed by pressing the contact button E. This results in a deflection of the indicator on the galvanometer, G, towards the end of the scale. The indicator is then set exactly on the line of the scale marked "10", by means of the rheostat adjustor, R. Button E is then released. The indicator on the galvanometer, G, should return to zero. The arrow on the dial, K, is then returned to the line marked "off". The apparatus is now in order to receive the experimental gas.

With the taps H and H' open, as shown in Fig. 3, a sufficient quantity of the gas to be tested is allowed to pass through the chamber, in order to flush it of any air or gas remaining from the last determination. Taps H and H' are closed. The arrow on the dial, K, is then set on

the line marked "CO_2". After allowing three or four minutes to elapse for the gas to diffuse into the instrument, contact is made with button E.* The pointer on the galvanometer scale indicates the percentage of CO_2. The present scale is made to read from 0 to 10 per cent.

A few brief remarks are necessary with reference to the source of electrical current. The battery consists of four "Fuller inert dry" cells, arranged in "series-parallel". These cells are most applicable for this work because when first received they are entirely "dead". It is only after water has been added and allowed to absorb that they become "active". The object of the "series-parallel" type of connection is to ensure the necessary potential and utilize the current capacity of the combination of cells to the maximum.

The cell is made by Fuller's United Electric Works, Limited, Essex, England. Directions for its use accompany each cell.

Since the expired air contains water vapour and since the latter has a heat conductivity of about thirty per cent greater than air, it is necessary to balance the effects of the expired air vapour in the CO_2 chamber by creating the same vapour pressure in the air chamber. In order to do this, the metallic cap on the back of the katharometer is removed. The plug, containing a washer, is then withdrawn and the absorbent material in the plug is moistened with water. The moisture keeps for a long time. One such apparatus has been in operation for over fourteen months, and has not required remoistening. It is advisable however, to remoisten every three months.

The first investigation necessary was to determine the limits of accuracy within which it was possible to determine carbon dioxide contents of alveolar air mixtures with the katharometer. For this purpose subjects were allowed to breathe into a Tissot gasometer and the expired gases were then analyzed, by means of a Haldane gas apparatus and a katharometer. In Table I are shown twenty of the comparative results. Though a large series of analyses have been made, it serves no particular purpose to record them all. Those recorded in this table were taken consecutively without selection from the records. In columns 1 and 2 are recorded the percentages of carbon dioxide found by means of the Haldane apparatus and katharometer respectively. In column 3 are recorded the ratios of the Haldane to the katharometer values. The arithmetical mean of the ratios of the whole series was 100.7, with a standard deviation of $\pm$ 1.25, and a coefficient of variation of 1.24.

TABLE I

PERCENTAGE CO_2 OF EXPIRED AIR DETERMINED BY HALDANE APPARATUS AND KATHAROMETER

Haldane (H)	*Katharometer (K)*	$100\frac{H}{K}$
2.58	2.55	101.1
3.22	3.17	101.5
3.42	3.42	100.0
3.57	3.60	99.1
3.30	3.26	101.2
2.66	2.65	100.3
2.47	2.45	100.8
2.98	3.00	99.3
2.82	2.70	103.5
3.10	3.15	98.4
3.13	3.10	100.9
3.16	3.10	101.9
3.40	3.45	98.5
3.60	3.55	101.4
3.92	3.90	100.5
3.20	3.15	101.6
4.06	4.00	101.5
3.05	3.00	101.6
2.88	2.85	101.1
3.78	3.80	99.4

Comparative data were then obtained to note the possible effects of such variations on the final results, expressed in terms of basal metabolic rates. The expired air in each case was collected by the usual Tissot method, and the basal metabolic rates were then calculated from the carbon dioxide values as found by the Haldane apparatus and katharometer. King's[1] standards for carbon dioxide elimination were accepted for the ages of twenty years and upwards for both sexes. Carbon dioxide values for the ages of fourteen to nineteen years were calculated from the Aub-DuBois calorie standards, assuming a respiratory quotient of 0.82. All values were recalculated, on the basis of cubic centimetres of carbon dioxide eliminated per minute per square meter of body surface. These standard values are recorded in Table II. In Table III are recorded the results of the above investigation in twenty individuals, three of which had hyperthyroidism and five had myxœdema. In

* Occasionally, after depressing the button E, the pointer on the galvanometer may deflect in the opposite direction (to the left). This may be avoided by depressing the button while the arrow on the dial, K, is either in the "off" or "test" position.

TABLE II
STANDARDS

CO_2 Elimination cc. per Minute per Square Meter of Body Surface

Age	*Male*	*Female*
14–15	130.0	121.8
16–17	121.6	113.3
18–19	116.1	107.6
20–29	110.1	101.4
30–39	109.1	100.5
40–49	106.2	99.6
50–59	103.6	96.5
60–69	100.6	93.7
70–80	97.8	90.9

the last two columns will be found the basal metabolic rates as determined by the Haldane and katharometer values respectively. Assuming effects of over ventilation to be inappreciable (to be proven presently) these results demonstrate the validity of the application of the katharometer for the determination of basal metabolic rates.

Since the katharometer makes possible carbon dioxide readings at frequent intervals (minute periods or less) during an experiment, the next step was *to determine how closely the arithmetical mean value of frequent readings of the katharometer observed during a test period would approximate the Haldane reading, which would represent the resultant mixture of the different compositions of the expired air. If the approximation was sufficiently close, one could dispense with the Tissot gasometer or Douglas bag by having the patient breathe directly into a meter, and allowing the expired air to pass from the meter to the katharometer.*

For this purpose a gas meter was obtained* and its efficiency was tested as follows. A set of flutter valves was so arranged as to allow the subjects to breathe directly into the meter, and at the same time prevent rebreathing of expired air. The meter was connected with a Tissot gasometer. The observed volumes of gas which passed through the meter were then compared with the volumes found in the gasometer. Having proven the efficiency of the meter, the following procedure was adopted.

Subjects were allowed to breathe directly into the meter, from this the expired air was passed through the katharometer and then into the Tissot gasometer, as shown in Fig. 4. By this procedure it was possible to (a) compare the ventilation rates determined by means of the meter with those of the gasometer, (b) make

* We are indebted to the Montreal Light, Heat & Power Consolidated, for their co-operation and for the supply of meters, gratis, during the period of this investigation.

TABLE III

Basal Metabolic Rates Determined by Haldane Apparatus and Katharometer

Hosp. No.	*Age*	*Sex*	*Height (cms)*	*Weight (kgms)*	*Body surface sq. m.*	*Total ventilation S.T.P.D.*	*Time (mins)*	*CO_2 per cent*		*B. M. R. per cent of normal*	
								Haldane	*Katharometer*	*Haldane*	*Katharometer*
4033/26..	27	F	167.5	50.6	1.56	52.3	10.0	3.18	3.25	105.1	107.4
4699/24..	35	F	144.0	54.6	1.45	45.8	9.0	3.10	3.04	108.2	106.1
Gross.....	57	F	158.0	63.6	1.64	63.3	10.0	3.50	3.43	140.0	137.2
Ward.....	47	F	167.5	81.2	1.90	46.2	10.0	4.06	4.00	99.1	97.6
2663/26..	18	F	153.0	47.0	1.42	44.4	10.0	3.88	3.81	112.7	110.7
3336/26..	23	F	159.0	76.2	1.79	57.1	10.0	3.92	3.90	123.3	122.7
3645/26..	23	F	151.0	56.8	1.52	62.2	9.0	3.20	3.15	143.3	141.2
3001/26..	30	F	149.0	45.2	1.36	53.9	10.0	2.76	2.74	108.8	108.0
5154/26..	16	F	151.0	42.4	1.38	53.2	12.0	2.88	2.83	81.6	80.2
2959/26..	40	F	150.0	47.0	1.40	54.2	12.0	3.05	3.02	98.8	97.1
15102/16..	17	F	160.0	63.8	1.67	61.7	11.5	2.78	2.72	78.7	77.0
5068/26..	17	F	163.0	50.0	1.52	54.7	11.0	2.65	2.65	76.4	76.4
5116/26..	27	F	160.0	59.2	1.61	60.6	9.0	2.48	2.51	102.3	103.5
1896/18..	70	M	154.0	58.4	1.56	54.5	12.25	2.80	2.89	81.7	84.2
630/26..	43	F	151.0	64.0	1.60	59.7	9.0	2.81	2.76	116.9	114.8
5456/26..	55	F	160.5	68.2	1.71	51.7	9.5	3.43	3.45	113.1	113.4
5465/26..	36	F	161.0	66.4	1.70	51.8	9.5	2.61	2.68	83.3	85.3
5463/26..	24	F	156.0	45.0	1.41	49.7	10.0	3.14	3.25	109.1	112.9
4781/26..	36	F	160.0	59.0	1.60	52.0	8.0	2.67	2.64	107.8	107.0
1257/22..	40	F	158.0	76.2	1.78	46.1	8.0	3.02	3.00	98.1	97.5

periodic readings of the carbon dioxide contents of the expired air by means of the katharometer,

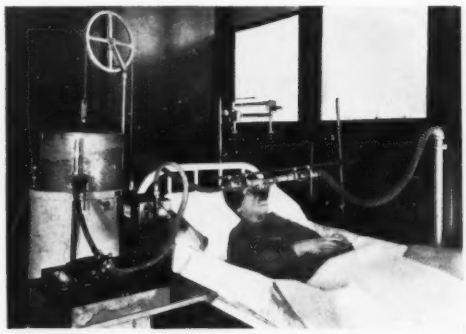


FIG. 4

and (c) collect the resultant gas mixtures from the Tissot gasometer for analysis by means of the Haldane gas apparatus. In Table IV are shown the percentages of carbon dioxide found in the Tissot gasometer with the Haldane apparatus, and the periodic and average percentages of carbon dioxide determined by means of the katharometer. In columns 1 to 5, are recorded the percentages of carbon dioxide, determined at two minute intervals by means of the katharometer. In column 6 are recorded the arithmetical mean values of these percentages. In column 7 are shown the percentages of carbon dioxide as found in the Tissot gasometer by the Haldane apparatus, and in column 8 the ratios of the Haldane to katharometer values. The arithmetical mean of all the ratios was 100.4, with a standard deviation of $\pm$ 1.88, and a coefficient of variation of 1.87. These results again demonstrate the accuracy of the katharometer, and also appear to justify the procedure of simply allowing the subjects to breathe directly into a gas meter, and obtaining periodically the percentages of carbon dioxide in the expired air by means of the katharometer, as shown in Fig. 5. By means of such a procedure, basal

FIG. 5

metabolic rate determination becomes a simple procedure.

It is of interest to note that the periodic fluctuations of carbon dioxide percentages during the test periods were remarkably small. This appears to offer reasonable proof that, as stated

TABLE IV

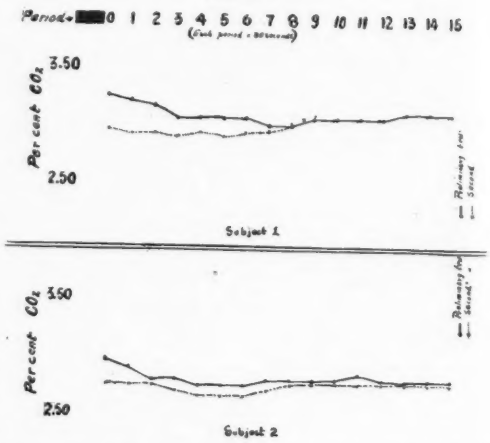
Periodic Katharometer readings (per cent CO_2)					*Average (K)*	*Haldane (H)*	$\frac{H}{100-K}$
2 min.	*4 min.*	*6 min.*	*8 min.*	*10 min.*			
2.85	2.80	2.75	2.70	2.70	2.76	2.76	100.0
3.00	2.80	2.80	2.80	2.80	2.84	2.88	101.4
3.00	3.10	3.05	3.10	3.00	3.02	3.05	100.4
2.80	2.80	2.75	2.60	2.60	2.71	2.78	102.5
2.65	2.60	2.60	2.65	2.70	2.64	2.65	100.3
2.60	2.60	2.50	2.45	2.40	2.51	2.48	98.8
3.00	2.90	2.85	2.85	2.80	2.88	2.80	97.2
2.90	2.80	2.80	2.70	2.60	2.76	2.81	101.8
3.55	3.50	3.50	3.40	3.30	3.45	3.43	99.4
2.80	2.70	2.65	2.60	2.60	2.67	2.61	97.7
2.75	2.75	2.70	2.60	2.50	2.66	2.67	100.4
3.05	3.05	2.95	2.95	2.95	2.99	3.02	101.0
2.95	3.00	3.05	3.05	3.10	3.05	3.04	99.6
2.95	2.95	2.95	3.00	2.95	2.96	3.00	101.3
2.90	2.85	2.80	2.80	2.75	2.85	2.89	101.4
2.75	2.70	2.75	2.75	2.75	2.74	2.76	100.7
3.50	3.45	3.40	3.43	3.43	3.44	3.39	98.5
3.65	3.60	3.55	3.60	3.60	3.60	3.66	101.6
4.05	4.00	3.95	4.00	4.00	4.00	4.06	101.5
3.20	3.05	3.05	3.05	3.09	3.09	3.16	102.3
						Average.....	100.4

above, overventilation, resulting in washing out excesses of carbon dioxide during the average period of an experiment, and *under basal metabolism conditions*, is not of sufficient magnitude to affect the results of metabolic rates determined by carbon dioxide elimination.

Positive proof that overventilation is a very small factor, *under the set of conditions for the test*, appears to be found in analyses of the different rates of carbon dioxide elimination throughout observation periods, and also in comparison of results of preliminary period tests with those of subsequent periods. Such comparative data were obtained in the following manner.

The galvanometer was made to record continuously throughout a period of observation by keeping the contact points at E in the katharometer together. It was thus possible to make readings every thirty seconds throughout a test. In each case, about twenty litres of air were allowed to pass through the meter and katharometer, as shown in Fig. 5, before records were made. In Chart I, are graphically recorded the results of two such tests. Many such curves were obtained. Since the results were practically identical, it serves no particular purpose to record all of them. The continuous lines represent the results of the preliminary periods, and the dotted lines, those of the subsequent

CHART I



tests. In Table V, are shown the value of all the readings. It will be seen that *if the results of the first few minutes of a test are discarded*, the compositions of expired air at the different times are remarkably constant, and the data of preliminary periods differ very little from those of the subsequent tests.

It is obvious that these data should be correlated with the ventilation rates, in order to demonstrate quantitatively the rate of elimination of carbon dioxide. *If the first three minutes of the tests are discarded* the ventilation rates of preliminary and second tests agree sufficiently to affect inappreciably the final results,

TABLE V

PERIODIC OBSERVATIONS OF CO_2 COMPOSITIONS OF EXPIRED AIR BY MEANS OF KATHAROMETER

SUBJECT 1			SUBJECT 2		
*Period	CO_2 percentage composition		Period	CO_2 percentage composition	
	Preliminary period	Second period		Preliminary period	Second period
1	3.30	3.00	1	3.00	2.80
2	3.25	2.98	2	2.95	2.80
3	3.20	2.98	3	2.85	2.80
4	3.10	2.95	4	2.85	2.75
5	3.10	2.98	5	2.80	2.70
6	3.10	2.95	6	2.80	2.70
7	3.10	2.98	7	2.80	2.70
8	3.05	3.00	8	2.85	2.75
9	3.05	3.05	9	2.85	2.80
10	3.10	3.10	10	2.85	2.80
11	3.10	3.10	11	2.85	2.80
12	3.10	3.10	12	2.90	2.80
13	3.10	3.10	13	2.85	2.80
14	3.15	3.15	14	2.85	2.80
15	3.15	3.15	15	2.85	2.80
16	3.15	3.15	16	2.80	2.80

*Each period represents thirty seconds.

expressed in terms of basal metabolic rates, as the following demonstrates:

	Average ventilation rate (litres per min.)		*Average percentage carbon dioxide*		*Average output CO_2 per min. (c.c.)*	
	Preliminary test	*Second test*	*Preliminary test*	*Second test*	*Preliminary test*	*Second test*
Case 1.....	6.82	6.88	3.12	3.04	212.7	209.1
Case 2.....	6.08	6.30	2.85	2.77	173.2	174.5

In view of the above findings, a series of individuals, known to be normal by their basal metabolic rates, previously determined, were observed by means of the new method, (simply breathing into a meter and making periodic observations with the katharometer). In order however to test the accuracy of this procedure still further, the expired air was allowed to pass into a Tissot gasometer as shown above, Fig 4. It was thus possible to obtain the following values:

1. Basal metabolic rate by actual respiratory quotient.

2. Basal metabolic rate by assumed quotient of 0.82.

3. Basal metabolic rate by katharometer method.

In calculating the basal metabolic rates with the assumed respiratory quotient of 0.82, it was assumed that the oxygen consumption values as found by the Tissot method, would have been the same, had a Benedict "portable" or Benedict-Roth apparatus been employed. The combined results are shown in Table VI.

All the data necessary for the different calculations are recorded. In the last three columns are shown the different basal metabolic rates. It will be noted that these subjects, all known to be normal, had basal metabolic rates within the normal limits of variation. In four cases the rates determined by CO_2 were between +11 and +14. (Nos. 7, 9, 11 and 13). This incidence was not, however, greater than those found by the other methods. (See Nos. 9, 10, 11, 13, with the actual R.Q., and Nos. 9, 10, 11, 13, and 16 with the assumed R.Q.). The arithmetical mean,

TABLE VI

BASAL METABOLIC RATES BY THREE DIFFERENT METHODS

No.	*Age*	*Sex*	*Haldane*			*Katharometer CO_2 per cent*	*Total ventilation (Litres) S.T.P.D.*	*Time*	*Height (c.m.)*	*Weight (kgm.)*	*Body surface sq. m.*	*B.M.R. per cent of normal*		
			Oxygen per cent	*CO_2 per cent*	*R.Q.*							*by actual R.Q.*	*by R.Q. = 0.82*	*by Katharometer*
1...	47	F	4.342	3.345	0.769	3.36	40.00	8.0	157.0	66.0	1.67	103.1	104.2	101.0
2...	42	F	3.312	2.737	0.827	2.77	56.99	10.0	151.5	53.0	1.48	102.0	101.0	107.1
3...	55	M	3.840	2.988	0.778	3.02	58.25	10.0	155.0	61.4	1.60	106.8	107.9	106.1
4...	42	M	2.969	2.397	0.807	2.36	66.67	10.0	169.0	56.5	1.64	90.4	90.7	90.3
5...	53	M	3.524	2.970	0.843	2.95	57.46	10.0	158.0	51.0	1.50	104.7	104.2	109.1
6...	42	M	3.215	2.759	0.858	2.71	70.30	9.0	174.0	86.0	2.01	95.3	94.4	99.1
7...	40	M	3.309	2.752	0.812	2.74	40.11	6.0	157.0	52.0	1.51	110.0	110.3	114.2
8...	60	M	4.150	3.300	0.796	3.33	54.26	10.0	174.0	81.0	1.96	90.7	91.1	91.6
9...	60	M	3.098	2.420	0.783	2.46	53.44	7.0	168.0	57.0	1.64	113.4	114.5	113.8
10...	18	M	4.110	3.010	0.732	3.08	72.43	10.0	181.0	62.0	1.79	114.5	117.2	107.3
11...	36	M	2.742	2.090	0.762	2.12	74.82	6.0	175.0	104.0	2.18	113.2	114.6	111.1
12...	23	F	3.508	3.054	0.870	3.00	39.10	7.0	162.0	48.5	1.50	103.4	102.1	110.2
13...	27	M	3.784	3.079	0.813	3.13	64.09	9.0	170.0	66.0	1.77	111.2	111.5	114.3
14...	30	F	3.378	2.756	0.816	2.76	69.39	9.5	162.0	87.0	1.91	104.0	103.8	105.0
15...	51	M	4.528	3.484	0.767	3.54	55.64	10.0	165.0	80.2	1.88	100.4	101.8	97.0
16...	51	M	4.791	3.461	0.721	3.53	56.99	10.0	165.0	79.0	1.85	110.3	113.2	104.4
*17...	51	M	2.933	2.261	0.771	2.29	55.39	7.0	170.0	67.4	1.78	99.2	97.9	98.3
*18...	51	M	3.127	2.377	0.760	2.41	57.89	8.0	170.0	67.4	1.78	96.5	98.7	95.9
*19...	51	M	2.849	2.290	0.804	2.30	61.87	8.0	170.0	67.4	1.78	95.0	95.4	97.1
20...	45	M	4.477	3.300	0.735	3.38	55.13	10.0	174.0	66.0	1.80	100.6	103.4	97.4

*Same subject.

standard deviation and coefficient of variation were calculated with each method. These were as follows.

	Actual R.Q.	*R.Q. = .82*	*CO_2 method*
Mean...	103.0	104.0	103.5
S.D.....	±6.7	±7.6	±7.4
C. of V..	6.5	7.3	7.1

In view of the above findings the procedure of simply breathing into a meter, allowing the air to pass from the meter into the katharometer, (Fig. 5), and recording readings at frequent intervals was finally adopted. The basal metabolic rate is obtained by correlating the galvanometer with the meter readings, and consulting tables for automatic calculations. Incidentally, it is economical, requiring neither oxygen nor soda lime. The method is simple, requires a minimum of technical skill, maintains the "open" principle, dispenses with gas analysis, and *simplicity was not obtained by the sacrifice of accuracy.* As a matter of fact, it is our opinion that owing to the attitude of the patients toward the "open" method, accuracy has not only not been sacrificed, but has been enhanced. The comfort of the individual with the "open" method is reflected in the remarkably constant values of the percentages of CO_2 observed at intervals of thirty seconds. The method is not applicable to those few conditions associated with marked fluctuations of respiratory quotients (such as diabetes, etc.).

In order to make the apparatus more practical, an attempt is being made to combine the meter, the katharometer and the arm which supports the mouth piece into one apparatus. The armpiece will be made collapsible. Since CO_2 values under the conditions of the test do not exceed five per cent, the galvanometer scale is also being so modified as to read within this value. With the same scale length this will, therefore, result in more simple and still more accurate readings. A recording galvanometer is also being included. The purpose of the recording galvanometer is for studies involving continuous observations of CO_2 output during a respiration experiment. No apparatus has, hitherto, made such a study possible with the same degree of accuracy.

Notes on care of katharometer.—The makers of the apparatus supply a list of instructions for its care. For the present purposes two are of particular note.

It is necessary that the platinum wires in the control chamber be continually exposed to water. The latter is contained in a small brass tube fitted in the bottom of the case. It will seldom need attention. When it does it may be removed by taking out the plate (with the bayonet joint) underneath the case and filling out the small tube which then projects.

The moisture condenses rather rapidly in the metal fitting on the top plate, and this should be cleared frequently. A tube is provided in this fitting to prevent water from getting down into the holes in the brass block of the katharometer. These holes may be inspected by unscrewing the two nickel nuts and removing the rectangular block from the top plate, care being taken on replacing it to make a good gas tight joint with the rubber washer.

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Gallstones in Children.—J. D. Carey, Fort Collins, Colo., relates the case of a girl, aged 9 years and 3 months, who was referred for operation for appendicitis. Two years previously, she began to have attacks of abdominal pain of such character and severity that she was compelled to be absent from school on an average of four days each month. The pain was located in the right side, associated with vomiting, slight fever and a small degree of rigidity. Attacks would come on suddenly and confine her to bed for a period lasting from two to four days. The appendix was removed and showed signs of slight chronic inflammation, though not sufficient to cause the amount of trouble that the girl was having. The pelvis was normal on examination; the gallbladder was greatly distended, and an oval stone 1 inch (2.5 cm.) in diameter, was lodged in the common duct. The gallbladder was removed and the wound closed. The recovery was uninterrupted. —*Jour. Am. Med. Ass.*, April 6, 1926.

NEUROBLASTOMA OCCURRING IN ADULTS

By Sara Meltzer, M.D.

From the Departments of Pathology of the Winnipeg General Hospital, and the University of Manitoba

NEUROBLASTOMA is a name applied to a group of tumours derived from the primitive nerve cell or neuroblast, and arising in the central nervous and sympathetic systems. The most common tumour of this group is a malignant one arising from undifferentiated nerve cells. Two other tumours, the ganglioneuroma and chromaffinoma, are also included in the group. They, however, are innocent and are derived from the differentiated nerve cells.

The neuroblastoma used to be considered a rare tumour, but of recent years it has been mentioned and described more frequently. This is due to an increasing knowledge of its nature rather than to increasing incidence, for in reviewing the literature many very accurate descriptions of neuroblastomata are found. These were referred to either as sarcoma of the kidney or liver, or in other cases as glioma when occurring in the brain. In a group of cases described by Tileston and Wolbach[1] beautiful diagrams illustrate the characteristic features in the microscopic picture, and they can now definitely be regarded as neuroblastomata. The number of cases reported in the literature thus gives us a false conception of the true incidence of the disease.

As the tumour is derived from the primitive nerve cell or neuroblast it may occur in any situation where such cells are encountered. It is, however, confined almost entirely to the sympathetic nervous system, and occurs most frequently in the medulla of the adrenal which itself is derived from that system. As far as can be determined only one case of neuroblastoma derived from the central nervous system has been described. Boyd[2] reports a case of neuroblastoma arising from the sympathetic ganglia along the 2nd, 3rd, and 4th lumbar vertebræ. Ewing[3] describes a most unusual case of neuroblastoma appearing in the left thigh of a child two years old, destroying all the muscles of the thigh, invading the pelvis, kidney and adrenal, and finally setting up metastases in the lung. He considered that this originated from the femoral sympathetic plexus. Symmers[4] has recorded a case occurring in the scapular region of an adult male.

Neuroblastoma occurs, in the great majority of cases, in infancy and early childhood. In Delafield and Prudden's[5] text-book it is stated that the cases so far reported have occurred almost without exception in infants and children. Symmers[4] remarks that in adults the number of recorded cases is too small and the clinical manifestations too bizarre to merit more than passing notice. In a very extensive paper by Wahl[6] he reviews the literature from 1885 to 1914 including cases which were designated as glioma, sarcoma, and lymphosarcoma, but which he considers to be definitely neuroblastomata, of the twenty-five cases described, five occurred in adults.

These tumours may be divided into two clinical groups. In the one, first described by Robert Hutchison,[7] one of the earliest signs is ecchymosis of the lids of one eye, frequently attributed to a blow or fall. This is followed rapidly by exophthalmos, and infiltration of the cranium and regional lymph nodes. Very often there may be little or no abdominal enlargement, but the finding of ecchymosis and unilateral exophthalmos occurring in a child, should immediately suggest an adrenal tumour, and when looked for enlargement of the kidney or liver is frequently found. The second group was first described by Pepper[8] in 1901. Here the chief phenomenon is rapidly increasing distension of the abdomen unattended by noticeable ascites or jaundice.

It was pointed out some years ago by Frew that the site of the metastases depends on whether they are derived from the right or left adrenal. Thus if the primary tumour occurs in the left adrenal metastases will appear

most frequently in the bones, especially the calvarium, but also in the liver and other organs, thus giving the first clinical variety. If the tumour is derived from the right adrenal, secondaries occur in the upper surface of the liver, the lung, and more rarely in the calvarium, and these fall into the second clinical group. In all recorded cases of secondaries in the right orbit the primary tumour was on the right side. The spread of metastases thus indicates a dissemination by the lymphatics rather than by the blood stream. We see that secondary growths occur most frequently in the skull, liver, and lungs, but they also occur in any of the bones, the sternum, vertebræ, ribs, and long bones; in the opposite adrenal, in the kidneys, and even in the skin.

Apart from its position there is nothing characteristic in the gross appearance of a neuroblastoma. Microscopically however, it possesses certain definite characteristics, and a typical case can be recognized without difficulty. It consists essentially of small cells with round nuclei rich in chromatin and scanty or imperceptible cytoplasm, associated with delicate fibrils which do not stain like neuroglia, collagen, or fibroglia by Mallory's method. A characteristic, but not constant feature is the formation of so-called "rosettes", consisting of two or three concentric rows of cells arranged about a ball of fibrils. Another arrangement frequently found is bundles of fibrils with cells clustered at each end. The tumours are usually very vascular. Secondaries may consist of cells only, without the fibrils.

The purpose of this paper is to record two cases of neuroblastoma occurring in adult males, seen at autopsy within six months of one another.

Case 1.—Clinical history.—The patient, a man forty years of age, was first admitted to the Winnipeg General Hospital on February 5, 1925, complaining of severe stabbing pain in his left chest, shortness of breath, and cough. Temperature at that time was 104°, pulse 70-100, respirations 20-40. Physical examination showed dullness, decreased fremitus, marked hyperæsthesia, and distant breath sounds over the lower half of the left chest both anteriorly and posteriorly. X-ray picture showed opacity of the left lower chest to the level of the fourth rib anteriorly. A diagnosis of pleurisy with effusion was made, and aspiration was attempted. After several unsuccessful attempts, on February 17th 30 ozs. of clear straw-coloured fluid were withdrawn on very deep puncture. The fluid contained no organisms on culture. On several subsequent occasions fluid was again obtained, but puncture was always very deep, and at no time was pus found. On April 30th a rib resection was done, and a small pus cavity discovered. There was very profuse hæmorrhage. Patient was discharged on July 13, 1925, with a diagnosis of empyæma of the left chest.

On September 27, 1925, while visiting in the hospital he had an epileptiform seizure which commenced with burning sensation all over his body, tremors of left arm and leg, spasmodic jerks of right knee, followed by unconsciousness. Weakness of the left arm and leg developed, and finally paralysis of the arm. There was some loss of expression on the left side of face as well. Babinski's sign and ankle clonus were obtained on left side. Blood pressure was 120-90. The left lower chest still showed the physical findings previously described. He complained of piercing headaches commencing in front and radiating to the occiput, and occasional spells of vomiting. The right fundus showed hæmorrhage above the disc.

In view of the previous empyæma, a clinical diagnosis of brain abscess was made, and localized in the right hemisphere, involving the cortex, its projection paths, and the corpus striatum. Complete hemiplegia of the left side developed with coarse tremors of right hand. There was evident aphasia. It was considered that the lesion had spread into the left hemisphere. Immediate exploration was advised, but patient died before anything was done.

Autopsy.—From the clinical history it was expected that an old walled-off empyæma would be found, with probably a brain abscess to account for the cerebral condition. On opening the pericardial sac we were astonished to find a large mass extending about the pulmonary vessels, directly continuous with a mass of glands about the lung hilus. The heart itself was not infiltrated. The left lung was densely adherent to the chest wall, and when torn away no pus sac was discovered, but a great deal of degenerated odourless material. This material came from the necrotic lower lobe, the greater part of which was occupied by a large tumour mass,

of a greyish colour, with red and yellow patches of softening. (Fig. 1). This tumour measured

FIG. 1.—*Case 1.*—Right lung showing almost complete involvement of the lower lobe by tumour growth, and masses of enlarged glands.

7 x 7 cm. in its greatest diameter. In the abdominal cavity further surprises were encountered. At the upper pole of the right kidney, just slightly invading the kidney substance was a rounded, firm, yellowish white mass, measuring 3.8 x 4 cm. (Fig. 2). Small portions of

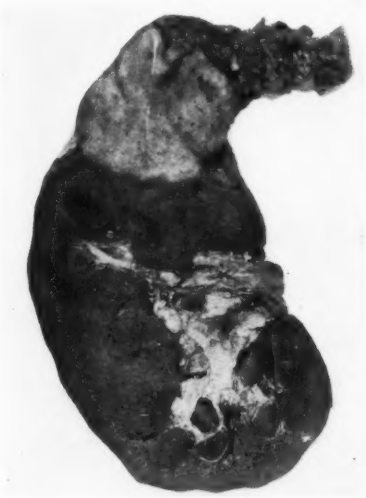

FIG. 2.—*Case 1.*—Right kidney and adrenal showing slight invasion of the kidney by the tumour.

adrenal cortex were seen adhering to the tumour. The normal shape of the kidney was preserved, and apart from slight loss of markings, presented no abnormality. We concluded that this was an adrenal tumour invading the kidney. The left kidney was quite normal. Just above the kidney, however, a soft hæmorrhagic mass measuring 3 x 3 cm. was discovered. This could not be recognized as adrenal tissue, but from its position, and the absence of a normal adrenal, it was considered to be a tumour of the adrenal.

The cranial cavity was next explored. From the exterior a very definite bulging of the right side of the brain was observed; there was marked flattening of the convolutions. When opened a soft hæmorrhagic tumour, measuring 6 x 3½ cm., was discovered in the right frontal lobe. (Fig. 3). It extended down to the basal ganglia,

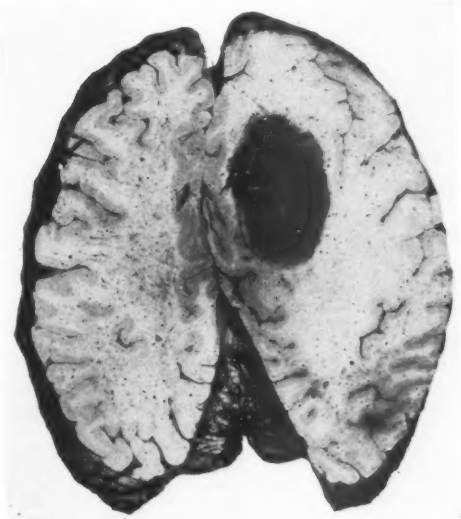

FIG. 3.—*Case 1.*—Metastatic nodule in brain.

and produced pressure on the opposite side of the brain by bulging beyond the mid-line. Though well demarcated from the surrounding brain it possessed no capsule.

Microscopic examination.—The adrenal tumour consists essentially of diffuse deeply staining cells, interspersed here and there with bands of fine, pale, fibrils. (Fig. 4). The cells vary slightly in size, but the majority consist of a small dark rounded nucleus, with a very scanty cytoplasm in some, but in most cells no cytoplasm is evident. Other cells are pyramidal in shape with again practically no cytoplasm. Where the cells are crowded together densely the nuclei are elongated. Numerous mitoses are seen. A few very large cells, undergoing division, are

present. The delicate fibrillar bands stain pink in eosin-hæmotoxylin sections. They do not possess the differential staining characteristics of neuroglia, fibroglia or collagen fibrils. The tumour is very vascular. Numerous thin-walled blood vessels are seen, and red blood cells lying free amongst the tumour cells. The "rosette" arrangement previously described is not observed.

In the lung tumour the same appearance is accurately reproduced. Here, however, there are large areas of degeneration. In the tumour of the brain the cells are very densely packed together, and the nuclei are oval, apparently as a result of pressure. This tumour is very much more vascular than the rest, and contains large spaces filled with red blood cells.

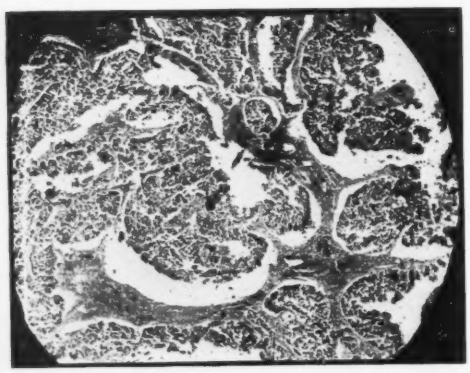

FIG. 4.—*Case 1.*—Microphotograph of adrenal tumour. The bundles of fibrils are well shown. x 50.

FIG. 5.—*Case 2.*—Portion of liver showing large masses of tumour.

Case 2.—Clinical history.—The patient, a man fifty-three years of age, was admitted to the Winnipeg General Hospital on March 7th complaining of pain across the upper abdomen, cough, and frequency of urination. For the past month there was a vague history of dull pain in the right lumbar region posteriorly and in the right hypochondrium, anteriorly. Two days before admission the pain became more severe. At the same time he developed a cough. On the day of admission the abdominal pain became acute. Patient had been operated on in the Winnipeg General Hospital six weeks previously for right strangulated hernia, and at that time nothing abnormal was noticed in the liver.

Physical examination revealed a tender, rigid upper abdomen, with a suspicion of fullness in the right hypochondriac and lumbar regions, probably due to an enlarged liver. Examination of the chest was negative.

The liver increased in size very rapidly, and

FIG. 6.—*Case 2.*—Right adrenal, showing tumour of medulla.

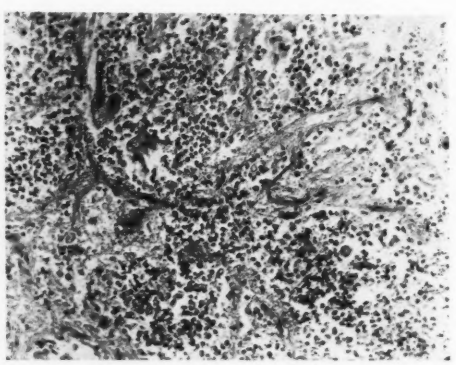

FIG. 7.—*Case 2.*—Low power microphotograph of adrenal tumour. Note the deeply staining nuclei and bundles of fibrils. x 200.

definite nodules could be felt on the surface.

Icterus index 9.4. Leucocyte count, 14,200.

In view of the general emaciation and extremely large nodular liver, a diagnosis of malignancy was made, but no primary source could be discovered.

Autopsy.—The body is that of a much wasted man with a very prominent abdomen. On opening the abdomen it is seen that practically the whole cavity is occupied by a hugely enlarged liver, which reaches to the right anterior superior spine. There is only a small quantity of clear fluid in the abdomen. The liver weighs 11 lbs. and is uniformly involved in a malignant process, being studded with tumour masses of varying size. On the cut surface these masses are of a greyish pink colour, and show little necrosis. Very little normal liver tissue remains. (Fig. 5).

Just below the pancreas there is a mass of enlarged lymphatic glands.

The right adrenal is of normal shape, but appears to be slightly enlarged. When cut into a small rounded tumour measuring 8 mm. in diameter is found to occupy the medulla. (Fig. 6). The cortex appears normal in the gross. The other abdominal organs including the left adrenal are normal.

In the right pleural cavity there are numerous recent adhesions particularly over the lower lobe. The lung is heavy and consolidated. The lower lobe is covered with a recent exudate. When the lung is opened a white mass 4 mm. in diameter and roughly spherical in shape is seen at the hilus. Several smaller white nodules are scattered throughout the lower lobe. The bronchial glands are enlarged and of a yellowish white colour.

The heart and left lung present no abnormalities.

Microscopic examination.—In the adrenal tumour the microscopic picture is exactly that described in Case 1, but here the large cells undergoing division are more numerous. This is in accordance with the very much more rapid clinical course of this case. Here again no rosettes are seen. (Fig. 7).

The liver, lung, bronchial and mesenteric lymph glands all reproduce the typical picture of the adrenal tumour. In the liver the cells are very deeply staining and vary greatly in size, indicating the extreme degree of malignancy and rapidity of growth in the liver nodules.

Summary

Neuroblastoma is a tumour almost confined to infancy, and early childhood. Both of the cases recorded in this paper occurred in adults. The first presented a picture of empyæma complicated by brain abscess. Malignant disease of the liver was the only diagnosis possible in the second. In both the involvement of the bones of the orbit, so characteristic a feature of the disease in childhood, was absent. It is obvious that recognition of the condition in the adult is a matter of great difficulty. The first case, although not typical, belongs to the Hutchison, the second to the Pepper type of neuroblastoma.

In the microscopic picture one feature common to both tumours is the absence of "rosettes". We know that in the development of the sympathetic system the cells are frequently found arranged in rosette form. In the fully developed adrenal medulla these do not occur. This raises the possibility of some relationship between the age of the patient, and the findings of "rosettes" in the microscopic structure.

I wish to express my thanks to Dr. William Boyd for his kind assistance in the preparation of this paper.

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Observations on Etiology of Tumours.—James B. Murphy, New York, concludes his report on his work with chicken sarcoma as follows: Anaerobic "cultures" of chick embryo and rat placenta have proved just as effective as so-called culture of malignant tumours in activating chloroform treated filtrates of a chicken sarcoma. The necessity of assuming a cultivated living organism in the interpretation of Gye's results is eliminated.—*J.A.M.A.*, April 24, 1926.

THE ETIOLOGY OF EMBRYONIC DEFORMITIES

By R. J. Bean, M.S.

Associate Professor of Histology and Embryology, Dalhousie University, Halifax

THE underlying causes in the development of human monsters has for centuries puzzled the anatomist and the physician. Many of the ancient peoples attributed such gross abnormalities to the influences of wrathful gods, devils, witches, and other supernatural elements in their religious worship. The moon was frequently considered as a causative agent and the word "monster" may be derived from the ancient word "moon-calf". The Greeks endeavoured to discard these supernatural theories and introduced the idea that monstrous development was due to perfectly natural forces. However, this idea gradually gave way to the weird, fantastic theories of the Dark Ages. Prominent among these theories were the beliefs that monsters were hybrids of bestial origin, or, the more familiar belief that maternal impressions are in some way registered and produce monsters from normal fœtuses.

The seventeenth and eighteenth centuries witnessed the overthrow of many of these ideas. Blondel attacked them from a philosophical point of view, while a scientific attack was led by such men as Haller and von Baer. Early in the nineteenth century, J. F. Meckel proposed an embryological basis for teratology, vigorously denouncing ideas regarding the effects of witches, devils and maternal impressions. As a result of Meckel's teaching, the first experiments in teratology were performed by Geoffroy Saint-Hilaire. Since the work of Saint-Hilaire hundreds of scientists have been attracted to the field of experimental teratology, and, proofs of the astounding influence of external environment upon the growing embryo are ever increasing. The earlier investigators laid much emphasis upon mechanical factors such as pressure, while more recent workers emphasize the chemical factors and what is most important of all, the time or developmental moment at which these factors are allowed to act.

Nearly twenty years ago Mall[1] in discussing the causes of monstrosities in animals wrote, "All the theories can be resolved into the simple question 'Are the conditions which produce a monster germinal and therefore hereditary, or, are they produced from normal germs by external influences'?" Scientific opinion is still divided, for the last decade has seen rapid advances in our knowledge of the mechanism of heredity and the geneticist has not ignored the problem of teratology. Concurrently, the biological sciences as a whole have covered an immense field of investigation in the problems of reproduction, including a careful analysis of the fertilization phenomena.

It is surprising when one reads the older voluminous treatises on human monsters, to find but the frailest suggestion of the real causative factors. Such accounts are usually accompanied by beautiful illustrations of the various specimens discussed, and often include interesting case histories and clinical notes. Too frequently one discovers that the chief purpose of these treatises is classification of embryonic deformities, or, classification of abnormalities found in the embryonic membranes. Whereas, a thorough examination of the embryo and deciduæ may throw some light on the origin of abnormalities, the method is more or less unreliable since the examination is usually made at a time when the primary causative agents have ceased to be effective, and the identity of the agent is obscured by secondary conditions, often pathological. The problem should be attacked through more direct methods, and it is only through the use of animals in which the opportunity for observation and experiment is unlimited, that such methods can be employed.

The problem of antenatal death can hardly be dissociated from the problem of maldevelopment. Human fœtal death rate is known to be high, and in all probabitlity it is even greater than the usual estimates based upon actual cases studied and reported. Many authorities estimate that every sixth pregnancy in private practice ends in abortion, and, if every case showing

a profuse loss of blood following retardation of the menses were carefully investigated, the percentage of abortions would undoubtedly be increased. Abortion is at least twice as common during the first month of pregnancy as it is during the second. There is possibly one abortion during the early months of pregnancy to every eight or ten births at term. In a large percentage of cases, aborted ova are obviously pathological, though some specimens show only minor defects. These minor defects found in early developmental stages, cannot be overlooked as potential factors in subsequent malformations. Statistics show that eighty out of every one hundred pregnancies end in the birth of normal individuals, seven are aborted as pathological ova, one produces a monster at term, and the remaining twelve are aborted as embryos or fœtuses showing various degrees of abnormality.

Much is known about the prenatal death rate in other mammals, and the facts which have been discovered are highly significant. Much of the work depends upon the validity of the *corpus luteum* count as an accurate indicator of the number of ova discharged during ovulation. A comparison of the number of corpora lutea and the average size of the litter of a given animal, nearly always shows a loss of ova. An idea of the percentage loss may be gained from a few tabulations taken from various papers and pertaining to various breeds of animals.

	Average luteum count	*Average litter*	*Percentage loss of ova*
Pig	20	12	40%
Rabbit	9.6	5	37.5%
Ferret	9.95	6	39.2%
Albino rat	9.6	6-7	33%
Opossum	20-40	10-11	50-75%

In animals which discharge but one ovum during ovulation, similar results are obtained by a different method of computation. Gowan[2] reporting on the progress of animal husbandry investigations in the State of Maine, found that only 78 out of every 100 cows bred became pregnant. Nevertheless, failure to become pregnant was not due to serious disease because only three of the group infertile at the first service, continued infertile after a third service. At least 20 per cent of the ova exposed to fertilization, failed to develop. Robinson[3] reporting on 28,000 matings of Clydesdale horses, estimates a prenatal mortality of 48 per cent, and from 3,640 matings of thoroughbreds nearly 59 per cent prenatal mortality. Post mortem examination of the uterus and Fallopian tubes of these animals may or may not reveal the presence of an ovum or embryo. In many instances young ova in the early developmental stages have been found free and unattached in the uterine cavity, and such cases show the possibility of an ovum undergoing maceration and absorption or sudden expulsion from the uterus, without leaving visible traces in the maternal tissues.

Considering all degrees of abnormal development, irrespective of developmental stages such as the ovum, embryo, or fœtus, the primary causative agents can be grouped under the following catagories: (1) Defective fertilization; (2) defective maternal environment; (3) defective germ cells.

Defective fertilization.—The physiology of fertilization in human beings is still wrapped more or less in mystery, although intensive studies of this phenomenon have been made on other animals. Primordial germ cells, segregated early from the developing soma, follow a cycle of proliferation and growth which terminates in ripening or maturation in the sexually mature adult. Maturation is characterized by a type of mitosis in which there is a redistribution of cellular constituents to the daughter cells. Moreover, a physiological change within the germ cells or gametes is implied since they attain the capacity for fertilization coincident with, or following maturation.

In the ovum, the onset of this fertilizable period is usually sudden, and its duration is relatively brief. The spermatozoon may retain capacity for fertilization indefinitely within the testis or its ducts, but, as shown by Lillie[4], with few exceptions under normal conditions this power is lost relatively soon after ejaculation. Spermatozoa lose fertilization capacity long before they lose motility, and the work of Bryce and Teacher[5], Triepel[6], and Mall[7] suggests that failure to recognize this fact has lead to many erroneous conclusions regarding the time of human conception. Thus, there is a period in the life cycle of the germ cells when the physiological optimum for fertilization is reached, and if fertilization does not occur, death and disintegration is the ultimate fate of the gametes.

Fertilization can only occur during a limited period of time during the life of the gamete. Furthermore, only a part of the fertilizable

period is characterized by optimum conditions for fertilization within the gametes. This fact is readily demonstrated in the laboratory by allowing freshly shed ova or spermatozoa to stand, and testing their fertilizing power at frequent intervals. These tests show that beyond a certain point the gametes reach a stale condition in which the fertilization susceptibility is progressively decreased. Experimentally, the use of either stale ova or spermatozoa for fertilization, is followed by retardation of development and subsequent abnormalities. In monospermic ova, a stale condition induces polyspermy which is always fatal to the normal development of such eggs.

Exclusive of environmental or genetic defects, normal human conception is dependent upon the union of the germ cells at a time when their physiological condition is optimum for development. Therefore, it is reasonable to assume that the actual meeting of the spermatozoon and ovum is often delayed until the physiological equilibrium of one or both makes normal development impossible.

Defective maternal environment.—The minute quantity of protoplasm acquired by the ovum at the time of sperm penetration, represents the only bit of living substance added to the organism during development. All increase in weight and volume after fertilization depends upon the assimilation of materials derived from the external environment. Even though the assimilative properties of the organism are highly efficient in the beginning, adverse conditions in the external environment will sooner or later tend to produce morphological and physiological abnormalities.

One common defect in human maternal environment is infection of the reproductive organs. As a result of infection, faulty implantation and deficient blood supply are familiar contributing factors to embryonic maldevelopment.

Recent investigations in the field of nutrition leave little room for doubt that the maternal diet may profoundly affect embryonic growth. Evans and Bishop[8] have shown that albino rats on being subjected to certain deficient diets, develop a pathological condition of the uterus in which necrosis of the placenta follows implantation. Ingier[9] has succeeded in producing miscarriage and positive evidence of impeded embryonic growth, by feeding pregnant guinea pigs on a scorbutic diet. The effects of lactation upon implantation and development of the blastocyst are also well known. Kirkham[10] found that fœtal atrophy and abortion was common when pregnant mice were allowed to suckle their young. Hammond[11] reports a similar condition in rabbits. Dingwall Fordyce[12] found that lactation concurrent with pregnancy in women, may result in arrest of fœtal development. These effects upon the young *in utero* represent a more complicated aspect of faulty nutrition. In all probability, the special maternal metabolism in both pregnancy and lactation is regulated through the agency of internal secretions. Therefore, it is conceivable that the metabolic condition which is favourable for milk production is unfavourable for the nutrition of an embryo.

It is difficult to determine the extent to which toxins in the maternal blood may be productive of embryonic abnormality. Indeed, this possibility has been absolutely denied by some investigators. Nevertheless, Schiffman[13] found that cholesterin, extracts of mammary gland, liver, or thyroid injected into pregnant guinea pigs and rabbits, arrested embryonic development and frequently caused abortion. Guyer and Smith[14] showed that the injection of lens tissue from mice or rabbits into fowls, excites the formation of specific anti-bodies. When the serum of such fowls is injected into a pregnant rabbit or mouse, the embryos of the species used as antigen may show all degrees of lens defects. Guyer[15] reports that lens defects may be produced by repeatedly injecting a pregnant rabbit with pulped rabbit lens, and, according to Boyden[16] the same investigator was recently able to demonstrate that simply needling the lens of rabbits may produce lens defects in their young. Other experiments might be cited which certainly prove that toxins in the maternal blood can and do produce embryonic defects.

Structural peculiarities, displacements, or tumours of the uterus are sometimes responsible for malformations in the embryo. However, mechanical factors in the environment can be greatly over-rated.

Scientists for two hundred years have recognized the fact that many types of embryonic deformity are due to developmental arrests. Stockard[17] has admirably summed up the results of research on this problem. Working with fish

eggs, Stockard was able to produce all degrees of double monsters and single deformities by either slowing up or completely stopping the developmental process for a time. This was done by reducing the oxygen supply or lowering the temperature, both methods giving identical results. The type of deformity depended entirely upon the stage in development at which the arrest occurred, the stages preceding gastrulation being more sensitive to experimental treatment than those after gastrulation. Simply slowing the process of development produced few monsters, while completely stopping it for a time produced many. Stockard's results are explained as follows: A metabolic gradient is established in the fertilized ovum and when cleavage takes place the first organs appear in the regions of high metabolic activity. These active regions dominate and inhibit the growth of the less active parts. Normal development is, then, a succession of tissue and organ formations, the parts first formed inhibiting for a time the differentiation of the later formed parts. When an embryo suffers a developmental arrest the active parts lose their metabolic dominance or advantage, so that upon resumption of growth the normal inhibitions are lacking. Instead of one central control, two or more regions become active centres of growth and monsters are formed.

It is highly improbable that the temperature of the mammalian uterus ever varies widely enough to cause developmental arrests in a growing embryo. The oxygen supply on the other hand, may vary considerably. Many teratologists argue with Stockard that the injurious effects of delayed or faulty implantation, as well as the effects of uterine displacements and tumours, are primarily due to an insufficient supply of oxygen.

Defective germ cells.—Sexual reproduction always results in biparental inheritance, the offspring showing a mixture of maternal and paternal characteristics. When a character is present in double quantity because it was present in both parents, the organism is said to be homozygous with respect to the character in question. As a contrast to the homozygous condition, an organism is heterozygous when the determiner for a given character is derived from one parent only. Some dominant characters are not viable except in a heterozygous form, because a double dose of the dominant is lethal and the embryo cannot survive.

Miss Saunders[18], has described the occurrence of lethal factors in several varieties of garden plants. Morgan and Bridges[18] have demonstrated at least forty such lethal factors in the fruit fly Drosophila.

Perhaps the most familiar case among mammals is the inheritance of yellow colour in mice. Yellow is a dominant factor in mice but a double dose is lethal, for, all homozygous yellow mice die. Kirkham[10] made a study of the actual death rate *in utero* of these animals and found that about 38 per cent died during the early stages of development. Ibsen and Steigleder[19] in a similar study confirm these results. The researches of Little[20] show that black-eyed white mice also carry a lethal factor which acts in precisely the same way.

After examining the pregnant uteri of over 500 sows, Corner[21] suggests that the high percentage of embryonic morbidity in these animals (20-30 per cent) must be due in part to genetic influences. In the majority of cases Corner was able to absolutely exclude faulty implantation, infections of the reproductive tract, or mechanical disorders of the uterus as possible causes for embryonic degeneration.

It is a well-known fact that animals may become sterile through intensive inbreeding. The female frequently becomes pregnant but never gives birth to a living young. Hammond[11] investigating this phenomenon in a special group of inbred rabbits, found fœtal atrophy to be of common occurrence. Since outcrossing is usually sufficient to restore fertility in such animals, it is apparent that an undesirable quality may be concentrated by inbreeding until it becomes lethal in effect.

At present there is but fragmentary evidence of genetic lethals in man. Investigation must necessarily be restricted to those cases in which lethal effects are expressed late in fœtal development or shortly after birth. Thus far there is every indication that lethal factors are always associated with morphological peculiarities suggesting an analogy to the yellow colour in mice. The work of Rischbieth and Barrington at the Francis Galton Laboratory for National Eugenics in England, includes some interesting observations upon the achondroplastic dwarf. For some unknown reason the death rate among

these dwarfs at birth is exceedingly high. This condition has been explained on the basis that a lethal expression may accompany hereditary achondroplasia.

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A CRITIQUE OF BENARD'S SO-CALLED LAWS OF THE FIRST-BORN AND OF ALTERNATION

BY MADGE THURLOW MACKLIN

From the Department of Anatomy of the Medical School of the University of Western Ontario, London, Ontario

IN 1924 R. Benard, writing in the *Bulletin de la Societé Medical des Hôpitaux*, of Paris, enunciated two propositions, concerning inheritance of malformations and diseases, which he designated as "the law of the first-born" and "the law of alternation".

The first of these "laws" is given by Benard as follows: "Dans une affection ou une dysmorphie héréditaire reconaissant la proportionalité mendélienne, l'aîné des enfants est toujours atteint." This may be translated thus: "For an affection or a malformation which is hereditary and which conforms to the Mendelian proportion, the first-born of the children is always affected." From an examination of Benard's pedigrees as set forth in his paper I understand that he means by "Mendelian proportion" an equal number of normal and abnormal children. This conception is, to the geneticist, of course, much too restricted, but taking it in the sense of Benard the "law" would mean that in pedigrees of families exhibiting a defect due to a Mendelian unit character, (such, for instance, as polydactylism) and where the number of the affected and normal children in the family was equal, the first child would always be found to show the defect. This I shall demonstrate, by reference to reliable recorded clinical experience, is incorrect, for many inherited abnormal conditions and is presumably incorrect for all inherited defects.

Benard adds a corollary, translated as follows: "If in regard to a hereditary malformation of the Mendelian type the first-born of that generation is not affected, then all the others of that generation will not be affected, and the inheritance of the dystrophy will be definitely arrested." Although at first glance this may appear contradictory to the "law" it is not actually so, because an affection of "Mendelian type", in Benard's mind, is one *capable* of being inherited in Mendelian proportion, but need not necessarily be so inherited. For example, he means that if from a mating, where one of the parties exhibits polydactylism, there should come a normal first child, then there can be no subsequent abnormal children, and the defect would have finally died out in that family, together with the possibility of its propagation. This, however, according to Benard, is a very rare occurrence, since he states that it would seem as if Nature always takes the first opportunity

to pass on a defect, and so in almost all cases in which there is an inheritable defect the first child shows it. Stating both law and corollary more simply, what Benard means is this: "If an hereditary defect is to appear in the children of an affected parent, it must inevitably occur in the first-born."

Benard's second "law", or "the law of alternation", states that in a family exhibiting an hereditary defect, if the children show the malformation at all, the abnormal and the normal children will alternate: "the law being quite rigorous for the first two children, and more or less rigorous after that." This means that in our family exhibiting polydactylism, and in which the first member is affected, the second member will be clear, the third quite probably affected, and the following members will show more or less regularly recurring clear and affected conditions.

Such propositions are so contrary to the experience of geneticists and those practitioners who have had to deal with large numbers of persons suffering from inheritable diseases or malformations, that they could be summarily dismissed as unworthy of notice. For the average practitioner, however, who is not a trained geneticist, nor familiar with large numbers of pedigrees of hereditary diseases, they may easily prove a pitfall, and I have therefore undertaken a refutation of them, not only because they lack scientific accuracy, but even more because they are dangerously misleading. Then, too, they have been given a great prominence and a wide circulation by reason of the fact that Benard's article appeared in abstract form in a leading medical journal[38].

Slowly enough to be sure, but still certainly, the public are awakening to the need for some practice of eugenic measures, and more and more, those afflicted with inheritable disease or deformity are coming to physicians to enquire concerning the chances of transmitting their afflictions. The physician who has accepted "the law of the first-born" is likely to advise his patient suffering from an inheritable disease, and who wants to know what are the possibilities of transmitting it, to risk having the first child, for, if it proves normal, he may then beget as many more as he wishes, with impunity, knowing that all of them will be normal. The patient follows this advice, but when, even if fortunate enough to have a normal first child, he has a second or third showing the defect or disease, he loses confidence in the physician, medical science and eugenic measures in general. To prevent such fallacious predictions, and the reaction of the public against eugenic measures that are founded on scientific knowledge, it has been felt wise to put on record that the laws of Benard are wholly inaccurate. Moreover, it seems to be a tradition, not limited to Benard alone, that if an inheritable disease is to appear at all it will always appear in the first-born, and that if it does not do so then subsequent children of that and succeeding generations will be normal.

These propositions have also a distinct medico-legal bearing. If it were accepted as true that if the first child were normal no abnormal ones could follow, then in case an abnormal child did follow a normal first child (which probably would occur in 50 per cent of cases), the legitimacy of the first normal child might be called into question. Such a contingency may seem very remote indeed, but in this generation when lawyers search medical records for evidence either to condemn or save individuals, and when courts are called upon to settle the legitimacy of a child the paternity of which the father denies, it is not inconceivable that such a statement, left unrefuted, could be seized upon by a lawyer to either disinherit or discredit a normal first child in a family where there was an inheritable defect. For these reasons it was felt that, however absurd the "laws" of the first-born and of alternation were, it would be well to refute them, even at the risk of imparting to them, by such discussion, an importance which they did not deserve. They would at least be left disarmed and harmless.

We have seen that by "Mendelian proportion" Benard means that half the children should be normal and half affected; if there is an uneven number of children the ratio must be as near to 1:1 as possible. He fails to take into consideration three factors which would modify a 1:1 ratio. The first of these is the type of character one is dealing with; it may be dominant, or recessive, or sex-linked, or it may not be a "unit character" which is at the basis of the deformity. The second condition is the genetic constitution of the parents with respect to the malformation. Depending upon the interrelation of these two factors there are six possible

types of mating, (provided that the deformity or disease is due to a unit factor), and in only one of them is the 1:1 ratio expected, and in only two of them is it possible to obtain it. The third factor is the error of random sampling which is apt to cause a wide variation from the 1:1 ratio where the families are small as they are in the case of man, even when the 1:1 ratio is expected.

Thus if one considers only those cases which are capable of conforming to these laws, one is confronted at once with the idea that on the basis of probability alone the laws are fallacious. We could not expect the affected child invariably to appear first any more than we could expect "heads" always to turn up on the first toss of a coin; nor could we expect the affected and unaffected to alternate any more regularly than we would expect "heads" to alternate with "tails" in consecutive throws.

But mere theorizing will not give us a final decision on the question of the validity of Benard's "laws"; we must subject them to an adequate test, we must see if they agree with clinical experience. To make this test I went to the literature, and first gathered together four hundred pedigrees of families in which there was a definite strain of inheritance of some abnormality. From this large mass of material I selected all of the families where the ratio of affected to normal children was 1:1, and where the children were arranged in order of primogeniture. It was never taken for granted that the cases were in the order of primogeniture unless there was a definite statement to that effect in the article, the one exception being those families reported by Cushing[7], and I have his letter to the effect that his families were so arranged. In all there were seventy-six pedigrees obtained which furnished reliable evidence for the testing of Benard's propositions. It need hardly be said that these cases were not selected because they did or did not agree with the hypotheses of Benard, but merely because they were the only cases, among the total of four hundred, which were altogether suitable for this purpose.

Description of the table.—The seventy-six families thus obtained were arranged in the table according to the hereditary disease with which they were tainted, and the groups of diseased families were further subdivided according to the author who reported the pedigree. The index number at the author's name gives the reference in the bibliography.

The diseases listed furnish a wide range for the testing of Benard's "laws", if they are in operation; and they are very favourable for this study inasmuch as they give evidence for the most part of being due to unit dominant characters. Those which fall in this class are ankylosis of the finger joints, multiple exostoses, peroneal atrophy, myotonia congenita, pterygium, membranous discharge from the nose, sickle cell anæmia, telangiectasia, familial jaundice, diabetes insipidus, osteopsathyrosis and cataract. Then there are also cases which are sex-linked and recessive in these pedigrees, *viz.*, hæmophilia, night blindness, colour blindness and retinitis pigmentosa; and one which is recessive, *viz.*, amaurotic family idiocy. There are also a few other diseases which are inherited but in which the mode of inheritance is not so clear.

The children of each family are arranged in the horizontal lines according to date of birth, the oldest being first. Each child appears under the number indicating its position in the family. The normal child is designated by the letter "n", and the affected child by the letter "a". This table gives us, I feel, a secure basis for the testing of Benard's propositions.

Analysis of the table.—It will be well to recall that Benard's first "law" states that in a family in which there is an inherited defect, and in which the abnormal and normal children have appeared in equal numbers, the first child is always affected. If this "law" is in operation, we should expect to find all children who appear in the first column of the table labelled "a" or affected. We note at once that a large proportion of them, however, are listed as "n" or normal. When we view the total we find that in only forty-one families was there an affected first child, whereas in the other thirty-five families in the list the first child was normal. If the chances were equal that either normal or abnormal should appear first, we would expect that 50 per cent of the families would have a normal first child, and the other 50 per cent an abnormal first child. Expressed as percentages, the above figures show that 54 per cent of the families had abnormal and 46 per cent had normal first children. These results are so close

to the 50:50 ratio that we can safely say that it was by virtue of no "law of the first-born" that 54 per cent were abnormal, but simply because the law of chance alone was operating.

If now we look at Benard's corollary, *viz.*, that if a defect is to appear at all it must do so in the first child, we find that it, too, is disproved by facts. Examination of the table shows no less than thirty-five families in which a normal first child was followed by one or more children showing the defect. This means that 46 per cent of the cases do not conform to the "law". We may say that, on an average, out of 100 families where there is an inheritable defect we will find fifty families where the first child was normal and where subsequent ones showed the malformation.

Examination of the table convinces us that Benard's "law of alternation" is also founded upon the sands of insufficient observation. If this "law" is to operate as Benard states, then we should find the vast majority of families having their first child abnormal, the second normal, the third abnormal, and so on. While the children might appear in other possible sequences, they should do so with far less frequency than in the sequence a:n:a:n, etc., as demanded by the "law". What does the table show, however?

Let us begin by considering the sequence in the first two children only in a family, regardless of its size. There are four possibilities, *viz.*, a:a, a:n, n:n, and n:a. If we determine the percentage of families falling into each class we find that 40.8 per cent show the sequence a:n; 27.6 per cent n:a, 18.5 per cent n:n, and 13.1 per cent a:a. It is true that the order of a:n is more frequently observed in these families than any of the other three, and hence it might seem that Benard's law found some support in these families. If we recall, however, that he states "the law is quite rigorous for the first two children, more or less rigorous after that", we at once see how little support is given by these figures. A law can scarcely be called "rigorous" which is observed in only two-fifths of the cases, when according to its own pronouncement it should be observed in practically 100 per cent. Hence we can say that Benard's law of alternation is not upheld by clinical evidence. Had the number of families in the list been ten or a hundred times as great the probabilities are that all four sequences would have

TABLE I

Disease	*Author*	*Children*											
		1	2	3	4	5	6	7	8	9	10	11	12	13
Ankylosis	Cushing, 7	n	a	a										
		a	n	n	a	n	a	a	n					
		n	a	a										
		n	n	n	a	a								
		a	n	n	a	n								
		n	a											
		a	n											
		n	a	n	a	n								
		a	n	a	n									
		n	a	n	a	n	n	a						
		a	n	a	n	n								
		a	a	n	n	a	a	n						
		n	a	a	n	a								
Multiple Exostoses	Percy, 29	n	n	a	a	a	a	n	n	n				
		a	n											
		n	n	a	a	a								
		a	n	a	n									
		n	n	a	n	a								
		a	a	a	a	a	n	n	n	n				
	Dwyer,8	a	n	a										
	Gorsline, 12	n	a	a	n	n	a							
	Gossage and Carling, 13	n	a	a	n	n	n	a						
		n	n	a	n	n	a	a	a	n				
Peroneal Atrophy	Macklin and Bowman, 21	n	a	a	n									
		a	n	n	n	a	a							
	Herringham, 16	a	n											
Myotonia Congenita	Rossett, 30	a	n											
	Nissing, 28	a	n	n	a	a		n	a					
		a	n	n										
		a	a	n	n	a	a	n	n	a	n	a	a	n
		a	n	n										
		a	n											
		a	a	n	n									
		a	n	n	a	a	n	n	a					
		a	a	n										
		n	a	a	n									
	Collier, 6	n	a	a	n									
	Hertz, 17	a	n	n	a	a	n	a	n					
Pterygium	Newman, 27	n	a	n	n	a	a	n						
Membranous Discharge	Gossage, 14	a	a	n	n	a								
Night Blindness	Newman, 27	n	n	a	a									
		n	a	a	n									
Amaurotic Family Idiocy	Weber, 33	n	n	a	a	n	a							
	Nettleship, 25	n	a	n	a	a								
	Smith, 31	n	n	a										
	Carlyll, 4 and Mott	n	n	n	a	a								
		n	a	n										
		n	n	a										
Sickle Cell Anæmia	Huck, 19	n	a	a	n	n	a	n						
		n	n	a	n	a								
Anæmia	Whipham, 34	a	a	n	a	n	n							
Hæmophilia	Wynter, 36	n	n	a	a									
Nystagmus	Cockayne, 5	a	n	n	a	n	n	a						
		a	n	a										
Athetosis	Turney, 32	n	n	a	a	a								
Retinitis pigmentosa	Wilmer, 35	n	n	a	n	a								
Telangiectasia	Goldstein, 11	a	n	n	a									
Fragilitas Ossium	Kellock, 20	n	a											
Familial Jaundice	Hichens, 18	a	a	a	a	n	n	n	a	n	n			
	Elliott and Kanaval, 9	a	n	a										
Muscular Dystrophy	Fearnsides, 10	a	n											
Deaf Mutism	Bowen, 3	a	n	n	a	a	n							
Cerebellar Ataxia	Batten, 1	a	n	n										
Diabetes Insipidus	Zundel, 37	n	a	n										
Colour Blind-Blindness	Nettleship, 22	a	a	n	a	n	n	n						
Cataract Senile	Nettleship, 24	a	n											
		n	a	n	n	a								
Cataract Coppock	Nettleship, 26	a	a	a	n	n	a	n	n	n	a			
		a	n	a										
		a	n	a	n	n	a	n						
	Harman, 15	a	n	a	n									
Cataract Lamellar	Nettleship, 26	a	n	a	a	n	n	a	n	n				
Tooth Defect	Macklin, *	n	a	a										
Totals	a	41	31	36	25	20	12	7	4	1	1	1	1	1
	n	35	45	29	25	18	12	12	7	6	2	0	0	0

*Unpublished pedigree of family in which there are only two incisors present in upper jaw. n=normal, a=affected.

appeared in approximately the same percentage of cases.

Let us again examine the list, this time observing the order in the first three children of all families of three or more. The order required by Benard's second law is a : n : a, but we find that those most often encountered are a : n : n and n : n : a both shown by 18.5 per cent of the families. The next most common is n : a : a, shown by 17 per cent of the families, and it is not until we reach fourth place in order of occurrence that we come upon the sequence called for by Benard's "law", *viz.*, a : n : a, which is present in 15 per cent of the families listed here.

Nor is the "law" upheld any more rigidly when we inspect the table to find the order which is most frequent when the first four children are considered. Most common appears to be the sequence a : n : n : a, shown by 16 per cent of the families, second, the order n : a : a : n occurring in 14 per cent, third, the order n : n : a : a in 12 per cent, and fourth in line the order which the "law" calls for, *viz.*, a : n : a : n, which we find in 10 per cent. When we hunt for the arrangements in which the first five children are listed we find that twenty different orders are represented (there are really thirty-two possible arrangements) and the one order which should appear most frequently if the "law of alternation" is in operation does not appear at all in the list of families in the table.

Summarizing the results obtained from our review of Benard's second "law" in the light of clinical cases we can state that the only instance in which there seems to be the slightest evidence in favour of it is in the order most commonly observed in the case of the first two children, the abnormal one appearing first and the second one being normal, but as already remarked, this greater frequency would probably disappear if the number of families considered was sufficiently large.

Summary

In conclusion it may be said that in those families where there is an inheritable abnormality, there is no greater tendency for the first child to be abnormal than there is for it to be normal. Abnormal children in such families may be born subsequent to the birth of a normal first child,—indeed they are liable to appear in 50 per cent of cases. There is no greater tendency for the affected to alternate with the normal than would be expected on the basis of chance. All possible arrangements of affected and unaffected appear. Such statements as those of Benard, based upon insufficient evidence, are pernicious, in that they warrant conclusions which are wholly unsupported by facts, and which may work to the detriment of individuals either from the eugenic or medico-legal aspect.

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STERILITY AMONG HYBRIDS*

BY FRANK N. WALKER, M.B.

Toronto

IN choosing sterility to demonstrate some of the metabolic aberrations of hybrids, I do so because in this condition a certain number of difficult variables can be easily eliminated. We are taught that all physiological variations are congenital or acquired. Since sterility cannot be laid at the door of heredity it must be acquired. We are likewise taught that all complaints of the human body are either functional or organic. In this discourse I do not propose to discuss any form of sterility that has an anatomical cause from the pathological viewpoint. It has been estimated that in the United States there are to-day nearly two million sterile couples who are still at the age of childbearing, and it is needless to say that in many cases it is the disappointment of a lifetime, especially to those who take their citizenship seriously. Since I intend to discuss here only functional sterility, allow me to review briefly some of the outstanding cases of this condition found in animal breeding.

The common mule has been recognized as sterile since the days of Homer, though Columnella quotes from Mago, a Carthaginian agriculturist, that in his country the fecundity of the mule was a frequent event, although it was regarded as a prodigy in Greece and Italy. He adds that these mixed mules do not cross again with one another, but only with the primitive species that gave them birth. Others have discussed the fact of sterility among mules in the northern climates. I am inclined to put some credence in this statement with regard to geographic latitude, as I will mention later that calcium metabolism is an important factor of infertility.

The female mule when fecundated with a male ass seldom reaches the full term of pregnancy. Abortion is very common in these pregnancies of heterogenous species. Another interesting point that need only be mentioned here is the variation in the term of pregnancy. It is worthy of remark that the dingo of Australia when crossed with the common dog becomes sterile at the fourth generation. The hybrids produced by the cross of the common fowl with guinea fowl have been found to be sterile up to the present time of writing.

The common wild goose mates with domestic geese, but the offspring are sterile. The same is true of hybrids, resulting from the cross between the goose and the swan. Of some five hundred species of wild pigeons, Darwin could not find a single well ascertained instance of hybrids between two species being fertile among themselves, or even when crossed with one of the pure parents.

In the cross between the wild passenger pigeon with the cage ring dove, the males are invariably infertile. In regard to this work with pigeons, Whitman states "The infertility is not to be confounded with sterility; it stands rather for various degrees of specific incompatability between the germ cells of the cross-mated birds..... in many cases the development of the egg is carried far enough to show that the sperm has entered and fertilized it. The development may halt at this point, or be carried to any later stage, even to hatching. The young

* Read at the Section of Obstetrics and Gynæcology, Academy of Medicine, on March 4, 1926.

bird may die within a few hours or live on, apparently doing well, for several days, a week or more, and then drop off, as if life were a time fuse calculated to end at a definite moment..... The author finds that the length of course to be run, although varying widely, is on the average cut shorter and shorter as the crosses range from close allies, to more distantly related species."

Facts along this same line are quoted by Meaker, of work done by Cuenot, and by Castle and Little on yellow mice. He states "these mice are an impure strain, carrying yellow as a dominant and black as a recessive colour. characteristic". According to Mendelian expectations of four offspring from such parents one should be pure black, one pure yellow, and two mixed, these last being yellow since that characteristic is dominant over the recessive black. As a matter of fact, the offspring were correctly proportioned with regard to the pure blacks and the mixed, but the yellow never appeared. Little found that the missing offspring actually started to develop but were invariably blighted at an early period of embryonic life. The reason appears to be that there are certain hereditary qualities capable of transmission according to Mendel's law which are in their very nature inimical to the development of an embryo which carries them.

This is a case of relative sterility. Morgan working on the fly Diosophila has produced a strain of which two members mated together are always sterile, while a male or female of the strain in question is fertile if mated with a partner of another strain.

Turning now to human beings I would begin by stating that the mulatto is not so fertile as the pure black or pure white types. Statistics show that where the coloured population of the United States has the largest number of mulattoes, the birth rate is much lower than where the coloured population is pure black. Physically the mulatto is inferior to either of the races that gave him cause. Physical deterioration may have its exceptions in racial crosses. Sulivan states that "the part Hawaiian is an improvement on the Hawaiian stock although the birth rate is lower". It has been mentioned that sterility is rather common in Jewish-Gentile marriages. The cross between the European and the Australian aborigines is almost sterile.

All these examples are among what are recognized as different races. But in these cases after all, is not the accepted racial difference due to the fact that recent history comes forward with proof of the difference? History is of undoubted value in the solution of the problem, but not by any means the only remedy. Ottenberg tabulated the percentages of various nationalities falling into each of the four blood groups. From this work might be drawn the conclusions that the African and Mediterranean peoples are predominantly in Group 1, the Teutonic and Celtic peoples mostly in Group 2, and those whose national home is known to be peopled with a liberal Mongolian mixture, fall mostly in Group 3.

These figures given by Ottenberg fell short of their mark in these regards. It is not stated whether the blood tests in question were done on sick people or well people, or whether those marked English, German, etc., are concerning the fair types or brunette types. There is that fog about the mass of figures which often surrounds a great multiplicity of cases. The veil that obscures truth is very adherent and must be removed thread by thread, otherwise wisdom is still incomplete.

In this discussion I intend to limit my remarks to observations on the results of crosses between blue and brown eyed individuals. One reason for this factor being taken, is that since colour of eyes follows the Mendelian formula, it is useful in studying racial mixtures. Second it is information that can be got fairly easily by history. Third, because in colour there is evidence of nature's hand having wrought very thoroughly and with definite purpose. Black cannot be white, nor white, black. There must be a marked difference in the constitution of an individual with blue eyes and one with brown eyes. Considerable opinion has been advanced by Dr. Crookshank to show that the human race is of three distinct species, namely, the Mongolian, Ethiopian, and Caucasian. Since our daily rounds bring us in contact for the most part with the Caucasians of western Europe, it is their composition and peculiarities with which we are most concerned.

Western Europe is divided east and west by a range of mountains, the Alps, which for many

thousands of years undoubtedly acted as a natural barrier to the wanderings of the early human race. On each side of this barrier grew up races with physical characteristics suitable to the climate and latitude inhabited by them. On the south side of the Alps we have a race with brown eyes, the colour being, without doubt, to shut out from the delicate nervous mechanism of the retina as many of the sun's rays as possible. On the north side of the Alps we have a blue eyed race, the blue colouring being to shut out only part of the rays shown in the solar spectrum. The rays being more oblique in that latitude and therefore fewer in number, only the hotter ones needed to be filtered out.

I can recall a man whose family characteristic gave him a medium height with a mental alertness beyond the average, his wife was taller than he, by about three inches, with a very placid disposition. These characteristics I learn, belong to her family. This couple have three grown up sons. One has his mother's height, and mental attitude. Another has his mother's height but his father's mental alertness. The third has his father's height but his mother's placid disposition. If this man complains that none of his sons are as good men as he is, the Mendelian school I think would answer that the fourth son who ought to have been like him in all regards was never born. I pick this family because factors of complexion and physical weakness can be ruled out for a period of years back, since having descended from U.E.L. stock, records are fairly complete.

It has been stated by Sir Arthur Keith that a pituitary excess exists in the negro. I have been able to satisfy myself that this is also the case in many brown eyed individuals. I am also quite satisfied that the thyroid gland is much more active in the fair blue-eyed races than it is in the brown-eyed races. These differences in the endocrine activities are undoubtedly a method of nature to adapt the individual to his climatic surroundings.

If the endocrine glands follow the Mendelian formula, it is not, I think, too imaginative to picture a cross between southern and northern individuals, with a southern pituitary function, and a northern thyroid function, and vice versa. I am satisfied that many such combinations exist, much to their own physical discomfort. I have never seen a functionally sterile individual, male or female, whose parents did not have opposite coloured eyes. If such exist I am willing to concede that there are other factors in functional sterility besides racial differences in the parents. One case I wish to quote at length is that of a young woman who, previous to her marriage, seemed sexually normal. Her menstruation was normal and without pain. Her health was well up to average. Shortly after her marriage she began to have dysmenorrhœa about every three or four months, the intervals being irregular. She also after some ten years of married life has suffered from a pronounced anæmia and is frequently taking tonic mixtures of various kinds. She has never been pregnant to her knowledge. The husband's semen has been examined and found normal. About four years ago she had a uterine curettement done with no change in the sterility or dysmenorrhœa. This woman stands about five feet eight inches in height and has dark brown eyes. Her father stands about five feet seven inches and has blue eyes. Her mother is about five feet five inches tall and has brown eyes. It can be seen she is taller than either of her parents and takes her eye colour from the maternal side. She states that her paternal grandmother was about her height. Her husband is slightly taller than she is and has blue eyes. Why did dysmenorrhœa begin after marriage in this case? From careful enquiries I am of the opinion that this woman gets pregnant every few months and for reasons of certain endocrine unbalance, aborts at the usual menstruation. This is highly possible when one considers that when pregnancy takes place, either the pituitary secretion is inhibited or the uterine muscle is rendered unresponsive to it. A combination of the two are most likely. In this case the change possibly does not take place and abortion occurs.

A second case I will quote of a woman twenty-eight years old who had been married five years and never had been pregnant. Menstruation had been more profuse on most occasions since her marriage, and her health was not the best. She consulted me for various ailments one of which was eczema on the hands and face. Among other things I prescribed 10 grains of calcium lactate three times daily. She did not menstruate again for over nine months and gave birth to twin girls.

This woman's father was about five feet ten inches tall with brown eyes, her mother about five feet eight inches in height with blue eyes and dark hair. The patient in question is about five feet six inches tall with blue eyes and fair hair. Her husband also had blue eyes and fair hair. I will leave it to the biochemist to speculate on the rôle played by the calcium in this pregnancy. The endocrinologists will likely claim that it is another case of glandular dysfunction. I have tried calcium lactate on other sterile patients without the result desired being accomplished.

It is not, I think, out of place here to mention a condition that I have found common in fair haired women giving birth to brown eyed infants. The fœtal head often gets impacted against the pubis, and prolongs delivery unduly in such conditions. It will be recalled that the southern woman's pelvic ratio is much higher than that of the northern woman. It will also be recalled that the Mediterranean peoples have a lower cephalic index. This lack of harmony in anatomical structures is a possible cause for the condition I have quoted, and also a cause of relative sterility in women whose children are not born alive.

I have asked mothers in these mixed families to name their children whose birth was difficult. On taking the cephalic indices of the various children I have found that the one whose birth was stated to have been difficult had an index of at least five points lower than the others. In some twenty cases I have only found one brown-eyed individual whose cephalic ratio was over 80. These results do not include any Mongolians. Such measurements, of course, must be taken after ossification has completed to be accurate. I have made measurements of mother and child in three of my recent cases. I have found in all three that the index was five points or more less in the child than the mother. The anatomists in the future, I hope, will be able to state with some degree of authority whether there is a definite cephalic-pelvic relation.

That races do not persist in other than their native climate I am well aware. A race can only disappear by three means; sterility, disease, and migration. For thousands of years the African races were carried to the north shore of the Mediterranean as slaves. In the age of Pericles the slave population of Greece outnumbered the free citizens by three to one. As slave owners prefer to breed slaves rather than buy them, there is no doubt that these slaves were bred, and on becoming free, mixed with the slaves of different origin. At the present time no trace can be found of the African races on the north shore of the Mediterranean. They came and were responsible for the construction of works whose ruins no progeny has survived to see the ruins of.

During the sixteenth and seventeenth centuries some of the most aggressive and creative amongst the Spanish and Portugese races settled in Brazil. At the present time no full blooded Spaniard is to be found in many parts of that country. These people came and brought their language and their civilization, but they themselves have disappeared.

The harm done by racial mixtures I believe is much wider than the scope of this paper. Its importance as a factor in asthma, eczema and spasmophilia are beyond question to me. So wrapped up it seems are racial mixtures with the ailments of mankind, that I have almost reached the stage that I would dogmatically assert that "If you show me a family where the doctor is metaphorically always on the doorstep, I will show you a family of profound racial mixture."

Let us, as the trained interpreters of the ills of mankind delve more deeply into the reasons that bring sorrow to so many households. Whether it be the disappointment of a sterile marriage, the disheartening result of child after child being born dead, or the financial embarrassment because it is too often sterile individuals who set a community's social pace, it matters not. The world and civilization did not reach its present status by sterility either relative or absolute. There is a cause, and the cause can be found, providing we jointly put forth our efforts to interpret our experiences, and at all times bear a virtuous tolerance toward those who attempt to assist us, even though we differ from them in minor details.

In conclusion, let me voice these opinions: firstly, that the individual who has one parent with blue eyes and the other with brown eyes, is not so normal in health and fertility as one who is derived from pure stock.

Secondly, that marriages between brown-eyed

men and blue-eyed women are likely to lead to difficult labour and perhaps still birth in case of pregnancy, due to incompatibilities between the shape of the fœtal head and the mother's pelvis.

Lastly, since the results mentioned above become a national problem they should not be treated lightly, especially when one recalls that in the world's history nations have always arisen to their greatest heights when their racial stock was most pure, and crumbled to decay when their racial components were most varied.

ABRUPTIO PLACENTÆ

By S. J. Newton Magwood, M.B.

Toronto Western Hospital

THE term "*abruptio placentæ*" (from the Latin "ab" and "rumpere", meaning to break away from) is nowadays rather generally applied to that condition formerly referred to as "accidental hæmorrhage", and refers to those cases where uterine bleeding occurs from separation of the placenta from its normal situation; *i.e.*, separation from a site above the upper zone of dilatation.

Frequency.—From the following figures it will be seen that the experiences of various clinics show marked differences in the frequency of this condition:

Hospital	*Cases of Labour*	*Separation*	*Incidence*
Sloan Maternity	20,000	212	1.06%
New York Lying-in ..	100,000	254	.254%
Rotunda	6,453	70	1.08%
Providence Lying-in..	914	7	.765%

Holmes of Chicago states that the clinical incidence is somewhere about one case in 500, and of pathological interest in about one in 200 cases.

Etiology.—Four main divisions of placental separations based on etiological differences, may be recognized.

(a) *Traumatic.*—Trauma is undoubtedly a factor in many cases. History is sometimes obtained of intended or accidental violence to the mother, occasionally of some particular over exertion, which would be, conceivably, sufficient cause for placental separation. There is little doubt, however, that in many cases where there is a history of only some slight trauma, there are co-existent pathological changes at the utero-placental site. Passage of large catheters or bougies for induction of labour may cause placental separation, but this would doubtless be recognized before serious consequences, if in careful hands.

Where a true or relatively short cord is present, late in the second stage of labour, the placenta may be pulled from its insertion, but here the obstetrician will be able to deal quickly with the situation without serious consequences to mother or child. The sudden emptying of a large hydramnion causing a negative pressure within the uterus, the loosening of the placenta sometimes seen after the delivery of the first twin, and intra-uterine manipulation during labour, may be included as possible causes under this heading.

(b) *Localized pathological changes at the* utero-placental site.—Under this heading may be mentioned such conditions as infarctions of the uterus due to emboli; any mechanical condition cutting off the circulation to a part of the uterine wall; uterine tumours exerting mechanical pressure, and thus by altering the fœtal and maternal circulatory relations, leading mechanically to separation of the placenta, and such placental diseases as syphilis and tuberculosis, which may lead to fatty and amyloid degeneration. Infarctions and cystic degenerations of the placenta may also be mentioned.

(c) *Systemic evidences of toxæmia with pathological changes, in the kidney, uterus and placenta.*—Minute hæmorrhages are usually noted in these cases between the muscle fibres and fasciculi, and in addition inflammatory and degenerative changes may be seen in the uterus and placenta; albumin and casts are found in the urine, with œdema and increased blood pressure.

Eclampsia is three or four times more frequent in primiparous women, premature detachment of the placenta is particularly a disease of multiparous women. Coincident eclampsia and detachment is comparatively rare. In 328 collected cases mentioned by Holmes, coincident eclampsia was noted in only 1.8 per cent. Willson reports six instances in sixty-nine cases, or 8.6 per cent. I have been unable to find any observation to the effect that the characteristic lesions produced in the liver by eclamptic poison, have been found in cases of *abruptio placentæ*.

(d) *Maternal systemic diseases.* — Chronic nephritis, Basedow's disease, arterio-sclerosis, and the hæmorrhagic diathesis, have been mentioned by various observers as causes. Burgess of Montreal reports an occasional case seen during the influenza epidemic of 1918. It is often very difficult to say whether such conditions are coincidental, or are causative factors. Arterio-sclerosis for instance, is usually a slowly developing disease, with clinical manifestations after the child-bearing period. Very high blood pressure in the child-bearing years is usually an accompaniment of some toxæmia. Hæmorrhagic diathesis has, however, been reported in four cases, in two of which there has been a definite history of hæmophilia.

Types of varieties.—The detachment may be either (a) partial or (b) complete. Partial separation may take place either centrally, or at the margin, and no definite rule can be given as to which cause or causes may be operative in one, and not in the other. In central separation, the bleeding may be totally concealed, being confined between the placenta and the uterine wall, with the placental margin intact in its attachments. Where the separation is extensive, the counter-pressure exerted by the fœtus and amniotic sac is not sufficient to mechanically act as a tampon and prevent the escape of blood from the uterine sinuses. For this reason the patient is in grave danger of bleeding to death, or more likely of dying from shock and hæmorrhage. If, however, the hæmorrhage in the central variety is small, indicating only a small detachment, and the patient is in labour, the loss of blood may not be sufficient to cause anxiety.

The *marginal variety*, except in some of those traumatic forms caused by bougies and internal manipulation, in all probability is caused in the first place by a small central hæmorrhage, which, as it increases, causes the blood to gradually separate a portion of the placenta towards the margin, and, in the marginal attachment where least resistance can be found, and escape into the vagina and becomes visible and external. External hæmorrhage does not always occur, however, when the margin of the placenta has been separated, for the pressure of the membranes against the uterine wall, may be so firm as to prevent the blood escaping into the vagina. The pressure of free blood and clots may break through the membranes and escape into the amniotic sac, and remain entirely concealed, if that portion of the membranes over the internal os is still unbroken. In complete detachment, the entire placenta is separated from the uterine wall, leaving all the sinuses open. Hæmorrhage here, of course, is severe, and may at least be visible in part, unless the placenta prolapses to cover the internal os. In these cases the child dies promptly, and the mother's life is in great danger.

Cases occur where there is moderate external or revealed haemorrhage, and very considerable internal and concealed bleeding, where for mechanical reasons, only a small amount of blood finds its way into the vagina. Thus it would be well to classify these cases of bleeding as *absolutely* concealed, or *relatively* concealed. The external bleeding should be recognized merely as a diagnostic sign of internal bleeding.

Clinical course.—There are mild cases of *abruptio placentæ* with moderate or little pain, or perhaps only a vague feeling of distress or fullness in the abdomen, few constitutional symptoms, and a little revealed or external bleeding which soon stops. Labour is very often rapid and the placenta is expelled together with more or less blood clot.

Again, however, the onset may be sudden and stormy. The condition of the patient is evidently different from what it had been previously to that moment, whether labour has set in or not. Labour may set in very suddenly with severe, sharp, pain, described sometimes as "tearing" in character. If the patient has had previous labours, she notes the difference between these early pains and those she remembers in former labours. They are more like the severe pains of the second stage, but more irregular and at shorter intervals. The character of this pain will depend more on the suddenness of the ac-

cumulation of blood and the rapidity with which distension of the uterus and stretching of the peritoneum takes place than on the amount of blood poured out. The patient shows anxiety and is restless. On examination, the degree of dilatation of the os and the effacement of the cervix is less than would be expected from observing the character of the uterine contractions. In addition to the exaggerated onset of labour, there are very severe colicky pains, lasting from a few seconds to two or three minutes. The pain is sometimes localized to the placental site. The uterus frequently is painful on palpation and there is likely to be difficulty in outlining the fœtus. Violent fœtal movements may or may not be noted in these cases where there has been sudden separation of a large portion of the placenta; in such cases the active movements may be attributed to the throes of the child due to its sudden asphyxia. Where the separation is slow and the accumulation of blood takes place slowly, the child dies quietly. Some of the babies do not die so much of asphyxia as of hæmorrhage, due to the tearing of one or more of the enlarged vascular villi of the chorion which project into the depressions of the decidua vera. The patient complains of faintness and vertigo, and is very likely to be nauseated and vomit. The nausea and vomiting are reflex in character, probably dependent on splanchnic irritation due to the sudden anatomical changes in the uterus, and the separation or splitting of the uterine peritoneum. Systemic signs of hæmorrhage soon manifest themselves. These are sensations of dizziness and faintness increasing to loss of consciousness, colourless mucous membranes and skin, thready rapid pulse, cold perspiration and respiratory signs of air hunger. Such symptoms should not be mistaken for a "heart attack", or for the accompaniments of a mere gastric upset or intestinal colic. Signs of uterine hæmorrhage will be present. An intelligent patient will sometimes realize herself that the abdomen seems larger. If the attending obstetrician has seen the patient recently, he will probably note that the uterus appears higher in the abdomen. When the placenta is situated in the front or on the side of the uterine wall, irregularity of contour may be noted on palpation, or even be visible to the eye. This will occur in those cases where the bleeding has been considerable and the margin of the placenta is still adherent to the uterus.

The following mechanical factors will result in absolutely concealed bleeding: (a) Adherent periphery of the placenta with central separation. (b) Membranes so firmly united to the wall of the uterus that the blood is retained in circumscribed areas. (c) Presenting part completely shutting off any way of escape of blood through the cervix. (d) Atresia of the cervical canal. (e) Occasionally the membranes may rupture allowing the blood to escape into the amniotic sac.

Where there is external bleeding, this is of course a positive sign of internal hæmorrhage, and the case is recognized as one of relatively concealed hæmorrhage.

Coagulation of blood may take place so rapidly that thrombosis at the site of the bleeding occurs, and with it, cessation of hæmorrhage. This might be termed a chemical, rather than a mechanical factor. The tone of the uterine muscle influences to a great degree the length of time an absolutely concealed hæmorrhage remains such. If good uterine contractions occur, resulting from the stimuli of the foreign body, the early escape of blood from the uterus will be noted. Symptomatically, except for the one visible evidence, there is no difference between absolute concealment and relative concealment. The external bleeding is merely a diagnostic sign hitherto absent.

Holmes states that "the one pathognomonic sign invariably present, in all true cases of *ablatio placentæ*, whether they be absolutely or relatively concealed, is the expulsion of old clots, and perhaps old blood, with the child and placenta."

Uterine consistency has been described by many authors as being of a board-like hardness, and the impression gained from many text-books has been that this is a more or less diagnostic sign. This is true in a small percentage of cases, but in many the consistency is "boggy" and quite flaccid. Just as in normal pregnant uteri at term, there is great variableness in the consistency of the uterine wall, so in abruption of the placenta, the consistency may range anywhere from extreme hardness to marked flaccidity. Shock is prominent, especially in those cases where distension of the uterus has been rapid, and may be due to the sudden

change in size of the uterus, the stretching and separation of the muscle fibres and peritoneum. Possibly the cause may be largely due to irritation of the sympathetic nervous system reflexly. The acute anæmia contributes to the shock.

I have been unable to get much evidence from reported cases, as to how great a factor increased systolic blood pressure is in these cases. Only, of course, where one has had blood pressure readings prior to the placental separation, can one be guided in forming an opinion. Often the blood pressure is not high. When high readings are noted, signs of toxæmia are very likely to be present.

Diagnosis.—Great stress should be laid on the recognition of evidences of systemic blood loss as shown by the facies, thready rapid pulse with decreasing tension, dyspnœa, and the usual signs of air hunger. Repeated blood counts and hæmoglobin estimations where they are possible to obtain, and the diagnosis is at all in doubt, will be of great value. Other symptoms such as nausea, faintness, pains, abnormal uterine consistency, may be regarded as less important evidence of the condition. Undue hardness of the uterus is regarded by some as a very good sign of the toxæmic variety. Toxæmic symptoms such as œdema and high blood pressure, if noted, may aid in the diagnosis. These, however, may be so influenced by the hæmorrhage incidental to the placental abruption, that one might readily be lead to believe them to have been entirely absent.

A careful history will almost always rule out the acute abdominal emergencies. Placenta prævia can usually be diagnosed from the history, from the fact that the bleeding is always painless and irrespective of trauma, and a low implanted placenta can be felt on internal examination. Rupture of the uterus occurs during labour, the uterus no longer contracts and probably no presenting part can be felt. The tear in the uterine wall may itself be detected bimanually, and the fœtus and uterus may even appear to be separate entities.

Prognosis.—In the very mild cases referred to the prognosis is good for both mother and child. In all other cases, however, it is much worse for the child than for the mother. Some authorities go so far as to say that practically all the babies will die, but this would appear to depend altogether on the severity of the symptoms and the degree of placental separation. Generally speaking, the greater the difficulties encountered in obtaining quick delivery, the poorer the prognosis for the mother. For this reason, cases already in labour should show a better maternal mortality rate. The anæmia induced is a predisposing cause of post-partum infection. Probably of greater importance in the prognosis, than the method of treatment, is the early recognition of the condition, and the promptness with which suitable treatment is begun. A diagnosis not made in the absolutely concealed cases until they have been converted into relatively concealed cases exposes the patient to increased danger.

A uterus which will respond quickly to the stimuli, setting up good contractions, will aid in the early delivery of the child, and will improve the prognosis. On the other hand, a very flaccid uterus which does not respond to the stimuli resulting from the abruption, may allow a great amount of blood to accumulate within its walls, and lead very quickly to a fatal ending. An extremely tense uterus in the absolutely concealed type, will aid in producing sufficient intra-uterine pressure to equalize that of the blood pressure at the site of the hæmorrhage, thus checking the bleeding, and allowing coagulation to take place. On the size of the sinuses opened will depend the degree of bleeding, even more than on the degree of placental separation. The greater the separation, however, the more likely is the baby to die from asphyxia.

Treatment.—Proper ante-natal care will accomplish much in preventing toxæmia which appears to be an etiological factor in many of the most severe cases. Radical treatment in all cases of placental abruption, is not indicated.

Milder types.—Some authors recommend that even these types should be delivered as expeditiously as possible, lest a mild one suddenly becomes severe. However, a great many cases where the loss of blood has been insufficient to cause any systemic symptoms and where the separation of the placenta has been insufficient to cause appreciable change in the character of the fœtal heart tones, and in whom the visible signs of fresh bleeding have ceased,

may be treated expectantly and allowed to go into labour normally, or if labour has commenced, allowed to terminate normally. It is preferable, however, that such cases should be in hospital, where proper treatment might readily be given, should at any time serious symptoms develop.

More severe types.—Treatment in these might well be considered from the standpoint of whether or not the patient is in labour. When a woman apparently in normal labour suddenly begins to bleed, one thinks immediately of the premature separation of a normally situated placenta, of a low insertion of the placenta, of a torn cervix or possibly of ruptured uterus. Internal examination will reveal whether the bleeding may be accounted for by tearing of the cervix or by the presence of placenta prævia. Sometimes the placenta may be low in the uterus but cannot readily be reached with the fingers. Here, however, rupturing the membranes will be good treatment for *abruptio placentæ* or placenta prævia, for in the former, labour will be facilitated, and in the latter, pressure from the presenting part will soon control the bleeding. If the bleeding continues, and particularly if the fœtal heart tones rapidly become slow or irregular, *abruptio placentæ* should be diagnosed, and the indication will be to deliver the child as rapidly as possible.

Where the placental separation takes place following the birth of the first twin, or on the too sudden emptying of a polyhydramnion, or during version, or extraction, delivery should be just as rapid as possible, both in the interests of the babe and the mother.

The main indications in the treatment of *abruptio placentæ* may be stated as follows: (1) The uterus must be emptied as early as possible. (2) The hæmorrhage must be controlled. (3) The anæmia and shock must be relieved. Since the child is almost always lost in the severe forms, the best treatment will be that which empties the uterus most quickly, with least danger to the mother.

In considering the best method for emptying the uterus, our decision will be guided in the largest measure, by the condition of the cervix. If the patient is in early labour and the cervix is pretty well effaced and is partly dilated, complete dilatation may be carried out manually, and if the head is engaged, forceps applied, or if not engaged, version and extraction done. Where manual dilatation is attempted in these cases, the endeavour should be to accomplish this with as little laceration as possible, and with as little additional shock as may be to the patient. Where the child is known to be dead, the operation of craniotomy is preferred by some, to the use of forceps.

Where little effacement of the cervix has taken place, but there is sufficient dilatation of the os to admit two fingers, the membranes should be punctured, a colpeurynter inserted and filled with sterile water, six to eight ounces. The upper two thirds of the vagina is then tightly tamponed with medicated gauze, or better still, as done in the Rotunda in Dr. Tweedy's time, with dry sterile cotton pledgets. Counter-pressure over the abdomen may then be obtained by the use of the Spanish windlass —an abdominal binder which is twisted very tight from the side by means of a stout stick. De Lee has recommended fluid extract of ergot in twenty-minim doses every two hours, being the only instance where he recommends this drug while the ovum is still in the uterus. Pituitary extract in four-minim doses, repeated as indicated, also may be used to stimulate uterine contractions. Large initial doses should not be given lest too violent contractions lead to rupture of an already weakened uterine wall.

Should the cervix be tightly closed and abdominal section for different reasons be entirely out of the question, the membranes should not be ruptured, but the cervix and vagina tightly tamponed and counter-pressure obtained as referred to previously. When sufficient dilatation has taken place, rupturing the membranes, the colpeurynter and manual dilatation will complete the preparation of the cervix for delivery. With a tightly closed cervix, however, with hæmorrhage still going on, Cæsarean section will probably be the operation of choice, and if the uterus does not promptly contract and maintain this condition with the help of massage, ergot and pituitary extract, hysterectomy may be necessary in order to prevent further bleeding. These are severe cases, where bleeding from the uterus after the operation is over, may be quite sufficient to turn the scales against the patient's

recovery. Vaginal Cæsarean section, while done by some successfully, is likely to prove very difficult on account of the small space in which to work and the obscuring of the field with blood.

If the placenta does not immediately follow the delivery of the child, and cannot be expressed by the Crede manœuvre, it must be removed manually without delay, together with all the clotted blood within the uterus, and then tamponade of uterus and vagina carried out.

Saline transfusions, as early as possible after diagnosis of severe bleeding has been made, should be carried out, followed later by blood transfusions. The time for carrying out the blood transfusions will depend a good deal on the condition of the patient, and the facility with which a suitable donor can be obtained. Horse serum may be tried. When the pain is very severe at the onset and the patient very restless, morphia gr. 1/6 may be required.

Occasionally a woman may be seen for the first time in deep shock, and any operative measures would appear to offer nothing but disaster. In such cases—and these are usually ones which have not been accurately diagnosed early, and given the early suitable treatment so necessary—it may be wiser to try and control the bleeding with tamponade and counter-pressure, and treat the shock with heat, saline and blood transfusions, and stimulants as indicated. If in spite of these measures, however, bleeding keeps up, operative procedures will be imperative.

It is well in all severe cases to explain the seriousness of the situation to the family, and when possible, consultation should be sought.

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POSTERIOR PRESENTATIONS AND THEIR TREATMENT

BY C. J. CURRIE, M.B.

Toronto

OCCIPITO posterior presentations are probably the most fruitful cause of injury to mother and death of the child of any of the complications of childbirth. The reasons of this are three-fold.

First it is the complication of childbirth most frequently met with; the best authorities agree that it happens in about 20 per cent of all cases.

Secondly, in a great many cases the condition is not diagnosed early enough and proper means for its rectification are not instituted. *Thirdly*, many of the ill-results attending this complication are due to the pernicious teaching that the proper treatment of these cases is to pursue a course of watchful waiting. It is perfectly true that a large proportion of cases presenting in a posterior position will undergo a process of spontaneous rotation, but it is also true that we do not know which cases will rotate and which will not. What we do know is that in either event, the case is sure to be attended with long continued suffering to the mother and danger to the child, and at the same time with anxiety and anguish of mind to the watching relatives.

We all know that a certain number of cases of appendicitis may recover without operation, that an appendiceal abscess may burst into the bowel and effect a spontaneous cure, but he would indeed be an optimistic and foolish doctor who would sit by and wait for one of these happy endings. An ordinary midwife can watch and wait for nature to take its course just as

well and at less expense to the family as a doctor.

Now consider what happens in an occipito-posterior delivery. The pains are usually fitful, irregular both as to time and force, the head takes longer to enter the brim; the membranes rupture early, removing nature's means of protecting the child from the effects of pressure in the early stages, and they are the natural agency for dilating the os. The cervix is further delayed in dilating by the ill-fitting head. Later, to effect spontaneous delivery great uterine and abdominal effort are necessary, but by this time in many cases both uterus and mother are exhausted, and the case comes to a standstill with the head in a position of transverse arrest. If, however, the case goes on, then because the head is deeply flexed, and the neck stretched and rigid, it cannot accommodate itself to the birth canal; moreover, the head and back must both traverse the birth canal at the same time, resulting in great stretching and tearing of the birth canal, and usually severe perineal tears. Meanwhile the child has been subjected to great pressure for a long time without the protection of the bag of waters, and is liable to death from asphyxiation. Also, because of the dependent position of the head and the great pressure on the body, the baby is liable to suffer from hæmorrhage on the brain.

In the treatment of these cases too much emphasis cannot be placed on the fact that an early diagnosis of the condition is absolutely necessary to a happy termination; and the diagnosis should present no particular difficulty. The clinical picture itself is often sufficient to put the physician on his guard, *viz.*, a history of early rupture of the membranes; the nagging and ineffectual pains with the head above the brim are of themselves almost pathognomonic. The exact position of the child may be ascertained by a careful abdominal palpation together with auscultation of the fœtal heart.

Having once ascertained the position of the child one must make a careful examination to see that there is no mechanical obstruction to its birth such as a contracted pelvis or other anomaly. If such there be it must be treated for its own sake irrespective of the position of the child.

In this connection it may be stated that if the case is seen early and the membranes have not been ruptured, and at the same time a careful measurement of the child by Ahlfeld's method shows the child to be abnormally large, then the patient should be given a light anæsthetic, and Mueller's method be used to see if there is a disproportion between the size of the head and the pelvis. If such should turn out to be the case, then the best results would be obtained by doing a Cæsarean section; otherwise the case will be a difficult one fraught with great danger to the mother and greater to the child.

If the child, however, is not abnormally large, then the best results at this stage would be obtained by the use of morphine and scopalmine and leaving it until the first stage is over. If when one examines the case one finds that the head is not engaged, the membranes are ruptured and the patient is suffering from ineffectual pains, I believe the best results will be obtained by giving her an injection of pituitrin, and associate it with a light anæsthesia.

At the end of forty minutes or an hour, one will usually find the head well engaged and the os dilated or easily dilatable; the obstetrician is then free to go ahead and do a manual rotation.

In any case once the os is dilated and the head engaged I do not believe that anything is to be gained by watchful waiting to see if the case will not undergo spontaneous rotation. We have no means of knowing that this will occur; and by simply waiting we are inflicting on the mother a long period of suffering and an ever increasing danger to the life of the child, only to find at the end that the desired result has not been obtained, and we have to resort to other means to effect delivery.

The best results in my opinion will be obtained in these cases by doing a manual rotation of the shoulders, and then applying the forceps.

In this manual rotation most authors advise using the hand whose palm faces the face of the child, and passing it up to the posterior shoulder, and lifting the shoulder past the sacrum through a quarter of a circle. As a matter of fact you will find the operation easier if you use the opposite hand as you have greater power of rotation. It will do no harm if you lift the shoulder through a half circle.

You will then be at least certain that you have rotated the head.

In many cases where the attending physician has felt sure that he has rotated the shoulders and still no progress is made it has been found on re-examination that the shoulders had gone back into the old position. This is invariably due to the fact that he has only rotated the shoulders to, and not past, the sacrum.

Frequently we are called in to see a patient that has been in labour a long time. We find her played out, and things at a standstill. Possibly the forceps have been applied but unsuccessfully. On examination we find the head jammed in the pelvis usually in an oblique diameter. Now it is impossible to reach the shoulders and do a rotation.

In this class of cases the treatment as a rule is not difficult.

First, one must make sure of the exact position of the child. Because of the large caput that usually exists in these cases, one can get little information from the sutures and fontanelles, so one must feel for the ear. Once having assured oneself of the exact position of the head one will apply to the forceps, preferably without the traction rods, in an antero-posterior position.

The anterior forceps must be applied first. If, for instance, the case be an R. O. P. the fingers of the left hand are passed up over the side of the head, then the left forceps is slid along the fingers, the handle of the forceps well depressed till the blade rests on the head in the biparietal diameter. Once the forceep is properly applied it will rest there. The right forcep is then passed in posteriorly, never using force, but easing it in till it locks with the anterior one. Now the forceps are grasped in one hand, eased up slightly, and rotated through a quarter of a circle, when delivery of the child is easy.

Finally, one occasionally sees a case where the head is jammed in the pelvis with the occiput in the sacral position. Some recommend the rotation of the head, with forceps and reapplication by the Scanzoni method. This manœuvre is extremely dangerous to the maternal soft parts, including the bladder and is inexcusable.

It were much better in these cases to do a deep episiotomy and delivery with forceps keeping the head in deep flexion.

NOTE: As this is the Journal of the Canadian profession, the Editor considers it right that the *Journal* should be open to an expression of the well considered views of every member. The writer of this article is a physician of experience and expresses strong views on an important question. The Editor therefore publishes the paper but deems it desirable to make the following statements:

The advice given is in many of its details in opposition to the teaching of our Medical Schools, and to the experience of our Maternity hospitals. The manœuvre described by him is not an easy one, and demands dextrous hands and much skill. The use of pituitrin in an early stage of labour may be fraught with danger. This drug does not always act with the same strength; at times, reaction is much greater than anticipated. On behalf of the profession the Editor must also take exception to the statement "that an ordinary midwife can watch and wait for nature as well as can the trained and experienced physician." Statistics, unfortunately however, have been quoted more than once showing that the waiting for nature of the trained midwife has given the safer and better end results.—EDIT.

The Serum Prophylaxis of Measles.—Debré, H. Bonnet, and C. Decam, describe the results they have obtained from the prophylactic injection of immune serum in patients or normal children exposed to measles. In March, 1925, a special laboratory was established in France for the collection of serum from convalescent and recovered cases of measles. From March 1st to November 18th, 2,897 c.cm. of serum was collected, mostly from adults; this was equivalent to 555 doses. The serum has been used chiefly for controlling epidemics of measles that have broken out in children's hospitals, but part has been devoted to the protection of normal children in families in which a case of measles has developed. With the results the authors are entirely satisfied. Of children inoculated prophylactically 83.5 per cent have been completely protected and 12.5 per cent have had only a mild attack; not a single fatal case has occurred. Although no strictly comparable data are provided, the authors state categorically that during the time mentioned 875 children have been protected from measles.—*Brit. Med. Jour.*, March 13, 1926.

REVIEW OF BLOOD-MATCHING IN TOXÆMIA OF PREGNANCY

By J. H. Goodall, B.A., M.D., C.M., D.Sc.

Montreal

THE old concept, fostered by religious ideals, which taught that a mother's child was blood of her blood and flesh of her flesh, has slowly given way to the medical concept, that every pregnant woman is a sick woman. The first regards pregnancy as a physiological, the second as a pathological process. Recent discoveries tend to show that these statements are but half-truths. . .

Blood-matching in relation to toxæmia is of very recent date. It is an endeavour to explain the toxæmia of pregnancy on the basis of an antagonism between the blood of the mother and her offspring; also to demonstrate that this incompatibility of blood rests upon a difference of blood groups in mother and fœtus; and lastly it is an effort to show that any invasion of the maternal circulation by the blood corpuscles of her fœtus may give rise to severe anaphylactic shock, simulating that which occurs when an individual is transfused with the blood of another belonging to a different or incompatible blood group.

In 1902 Simon Flexner found at autopsy, that in cases of death from bacterial disease many of the blood vessels of the body contained clots of a very striking character. These were hyaline masses and differed from ordinary clot formation in that they were merely masses of agglutinated red blood corpuscles without fibrin, without leucocytes, and (unlike ordinary clots) filling the whole calibre of the vessel. The name of agglutination clot was given to this process. He later showed that the agglutinative clotting could be brought about by substances other than bacterial toxins, such as chemical reagents, and still later it was found that agglutinative clots frequently resulted from the intravascular introduction of blood showing a different blood grouping or incompatibility. So that agglutinative thrombi in internal organs may arise out of bacterial or chemical agents or by incompatible blood transfusion.

Flexner, in the same year, published the following paragraph: "For the study of the possible occurrence of agglutinative thrombi in a disease, probably not of bacterial origin, there was a case of eclampsia in which the hepatic lesions, consisting of necrosis and hæmorrhage, were numerous. There was abundant evidence that the thrombi in the neighborhood of these areas were nearly all of the agglutinative type." Following immediately upon this work came the researches by Pearce, published in 1904, under the caption "The experimental production of liver necrosis by the intravenous injection of hæmagglutinins." In this work he proved beyond the shadow of a doubt that necrosis in all organs of the body can be invariably produced by the injection of hæmagglutinins, and by special means it was demonstrated that the thrombus formation precedes the production of necrosis, and that the cause of the necrosis is largely mechanical and not necessarily toxic, as is usually assumed.

Basing his work upon the foregoing articles, McQuarry published the results of his researches in the *Johns Hopkins Bulletin* in 1922, in an article entitled "Isoagglutination in newborn infants and their mothers—a possible relationship between interagglutination and the toxæmia of pregnancy." His opening paragraph is interesting. "Various possible explanations for the appearance of agglutinated red blood cells in the maternal blood stream during pregnancy suggest themselves. Among these is the possibility of isoagglutination between the blood of the mother and that of her offspring."

McQuarry examined 180 cases in all. Blood was taken from the mother's arm vein and from the severed umbilical cord at birth—a portion citrated and a portion non-citrated. Tests were made to determine the effect of the maternal serum upon the child's blood corpuscles, and the reaction of the child's serum upon the mother's corpuscles. When possible, also, the blood group of the child was determined. The results of these investigations demonstrate that

in 25 per cent of cases there is incompatibility between child and mother, *i.e.*, that interagglutination takes place when one blood is brought into contact with the other, and that they are in different blood groups. The remaining 75 per cent are compatibles. But of these about 20 per cent have not as yet developed blood grouping; *i.e.*, they are not isoagglutinative. Many of these may later develop a blood group antagonistic to the mother. In the remaining 80 per cent the two blood groups were the same or compatible.

It is not known how early in fœtal life children may develop isoagglutinative properties, although it is suggested by McQuarry that it is seldom or never before the beginning of the third trimester. These facts establish the impermeability of the placenta. It was also demonstrated that in forty-two cases the mother's serum agglutinated the child's red blood corpuscles, but in only five cases did the child's serum react upon the mother's corpuscles, showing that the receptors are present at birth much more commonly than the agglutinins. McQuarry then endeavoured to demonstrate that there may be some relationship between the incompatibility of the mother's and the fœtus's blood, and toxæmia. For this purpose he chose twelve outspoken cases of toxæmia, including two cases of eclampsia. Of these twelve cases, 75 per cent showed distinct interagglutination between the mother's and child's blood. They were shown to belong to incompatible groups. Another group of eighteen cases of probable or potential toxæmia was chosen by the clinicians. In these again 70 per cent of the cases were incompatibles and in different blood groups.

Since McQuarry's work was published several articles have appeared either confirming or refuting his conclusions. I need not spend any time over the confirmatory works, several of which are of quality, but I feel I must say a word about two articles in rebuttal. The first is by de Biasi of Harlem, covering one hundred cases. This work does not deal with toxic cases, only with interagglutination between mother and offspring. The results obtained by him are contradictory to McQuarry's. His work how ever is slipshod. Often forty-eight to seventy-two hours elapsed between the collecting of blood and its examination, and his methods are questionable. The second work is that of Zotterman and Wildmer of Sweden. This work confirms McQuarry's as to interagglutination between mother and child but refutes his work as to the relationship of toxæmia to incompatibility. I think this is a thesis for his doctorate. His method of collecting blood is very questionable and the toxic cases are chosen with such poor clinical discrimination that the book loses all its value.

A monograph by Travlos of Paris, inspired by McQuarry's work, has appeared of late, but I have been unable to secure a copy.

The results submitted are strongly suggestive of the existence of some relationship between incompatibility of the blood group of the pregnant woman with that of her fœtus, and the development of eclampsia or toxæmia.

The first question which naturally arises is—is there any resemblance between the anaphylactic shock due to incompatible transfusion and toxæmia or eclampsia? There is a very marked similarity in symptoms. They consist of any or of all of the following clinical phenomena: rigors, fever, vomiting, nausea, embolic and thrombotic phenomena, jaundice, hæmoglobinuria, albuminuria, œdema, urticaria, pruritus, headache, dizziness, blurring of vision, epigastric pain, increase in blood pressure, convulsions, acute anaphylactic shock, coma and finally death. Kimpton has described the mode of death in two of his cases of incompatible transfusion as being anaphylactic in type.

If the foregoing theory is true, a great new subject of research is opened up. A scientific explanation for the occurrence of toxæmia and eclampsia has been found. Many things heretofore impossible to explain now admit of easy solution. Let us endeavour to apply the theory and see how it meets the demands. First of all, for the fulfillment of the toxæmia on the above basis certain conditions must be present. Firstly, there must be incompatibility between mother and fœtal blood. Secondly there must be invasion of the maternal stream by the fœtal corpuscles. This implies a solution of continuity of the placental barrier.

That the first condition is present, *i.e.*, incompatibility, has been fully established by the above quoted works. But, as regards the second problem, how can a solution of con-

tinuity in the fœtal circulatory vessels occur? We all know that white infarcts of the placenta are present in all cases of toxæmia. The more subacute the toxæmia, and the longer its duration, the more numerous the infarcts, until at times the whole placenta succumbs bit by bit. These areas of white infarcts are old. When seen within twenty-four or forty-eight hours after development they present only intense engorgement, similar in every respect to the condition produced by Pearce experimentally in the liver and other organs by injection of hæmagglutinins. After forty-eight hours they turn white. Each such infarct, which is in my opinion but an agglutinative process, becomes a solution of continuity of fœtal circulation, and may allow escape of fœtal elements into the maternal circulation. Moreover, it has been proven that but small amounts of fœtal or other agglutinable substance are required to produce the phenomena of anaphylaxis.

The recent work of Young demonstrates that the toxæmia of pregnancy is due to premature separation of the placenta, or placental infarcts, and that these always precede the toxæmia, showing that the barrier must be broken before toxæmia develops. If toxæmia is akin to anaphylaxis, how has our conservative treatment in the past been productive of results? An explanation here is difficult, I must admit. If thrombotic processes are developing owing to invasion of the maternal circulation, it is difficult to see how the process can be arrested. Naturally, the symptoms will be acute or chronic, according to whether there is a large invasion of the maternal circulation or a slow chronic leaking. The large invasion will bring about a sudden cataclysm, with rapid convulsions and death. Treatment of course in such cases is of no avail. The statement has frequently been made that a certain percentage of cases of eclampsia are doomed from the onset, but in the chronic cases, relieving the burden on the organs of elimination by lessened ingestion of food and by purgation, must necessarily hasten reparative process.

How does the theory fit the facts of incidence of eclampsia? Eclampsia is a disease of the last three months of pregnancy, and it has been shown that there are practically no data available concerning the earliest appearance of isoagglutination in the fœtus, but it has been shown that it is present in a surprising number of newborn infants, some of which were premature. Consequently, it may be reasonably assumed that in some cases the reactions appear early in the last three months of pregnancy, when the toxæmia is also prone to occur.

It may be that the difference in blood grouping between mother and fœtus is but an index to a fundamental dissimilarity between the body proteins of the two. This dissimilarity may be present from the beginning of pregnancy, but may not be in sufficient quantity to be demonstrated in vitro. If such a supposition prove true, there is a ready explanation for the incidence of pernicious vomiting.

McQuarry suggests that the post partum eclampsia should be regarded as a "delayed reaction," the blood having passed from fœtal to maternal circulation when the placenta separated at birth, but without manifesting its most striking effects until a few hours later, time being required for the development of the thrombi and lesions in liver, kidney, brain, etc. How readily this theory of eclampsia explains the various clinical types of the disease, the renal, the hepatic, the cerebral, the hœmorrhagic! It offers also a ready explanation for those fulminating cases that come on as a "stroke from the blue", without any warning or premonitory signs—a large invasion, a great anaphylactic shock.

How easy also to explain many of the sudden deaths of the fœtus *in utero*—an invasion of the fœtal circulation by the serum of the mother and a sudden coagulation in the fœtal circulation. It offers also a scientific explanation for the incidence of convulsions of the child *in utero*, or shortly after birth.

It has been my fortune to have seen seven cases of eclampsia in consultation in recent months, three in the past four days, one bearing twins. The blood of these were compared mother against child, and in every case there was incompatibility. In the case of the twins, the second twin was delayed in birth for four hours after the first had been born. The fœtal heart had been heard several times in the interval. It suddenly ceased. Version and extraction was finally done. When the membranes were ruptured the amniotic sac held a large amount of black blood-clot which gave all the appearance

of hæmolysis. When the placentas were delivered the umbilical vein of the dead child was occluded at the placental surface. The cord was blanched, but the placenta was tensely engorged throughout. This has been preserved for examination for death *en masse* by agglutinative thrombosis of its main vessels. In another specimen in my possession one large vessel in the placenta had become thrombosed, and that half of the placenta seems to be undergoing degenerative change of the nature of infarction. The fœtus had died *in utero* a short period before delivery.

What should be the further lines of research to establish the relation of toxæmia and incompatibility? Children inherit their blood grouping from their parents. This follows well-defined laws laid down by Von Dungern and Herschfeld, and is in accordance with the Mendelian laws. Therefore, if the blood groups of the mother and the father are different there is liable to be incompatibility. If on the other hand the mother's and father's bloods are compatible, the child's is likely to be so too. Therefore a large number of parents should be grouped and an effort made to demonstrate that toxæmia occurs only when there is incompatibility.

How can we explain the incidence of eclampsia in one pregnancy and its absence in others? It is to be remembered that incompatibility of blood groups in mother and newborn is not in itself sufficient to produce anaphylaxis, there must be a break in one circulation to afford contact of the incompatible bloods. Many, in fact probably most, cases of incompatibles will go through pregnancy without a rupture.

A large number of placentas should be examined for the presence of infarcts, and the association of these with blood incompatibility placed beyond a doubt. An endeavour should be made to show that the greater incidence of eclampsia or toxæmia in twin pregnancies is due to the double chance of incompatibility between mother and child. There should be investigation of the brain of the mother dying from eclampsia for evidence of agglutinative thrombi. Every dead fœtus or newborn should be examined with a view to determine the presence of anaphylactic agglutinative thrombi.

In short, recent work has opened up a rich field for investigation, and it would seem that treatment of a specific nature is as yet not in sight, for if this theory prove true it is difficult to see how incompatibles can be turned out compatibles. So far as our present knowledge goes, blood groups are both hereditary and fixed.

Pyelitis in Female. — J. M. Hundley, Jr., Baltimore, agrees with Helmholz that alkalization has no specific action, although it may have slight diuretic effect. However, the drinking of large quantities of water, from 3 to 4 quarts a day, is of the greatest value, because it induces a mechanical flushing of the kidney. Hundley still uses alkalis because by their use a larger quantity of water will be consumed and the patient feels much better if he is taking some form of medicine. It is of importance to determine the type of organism that is producing the infection, for if it is due to a streptococcus or a staphylococcus it can be quickly cleared up by the oral administration of hexylresorcinol. The infections due to the colon bacillus are very resistant to this drug, and unless the bacterial count is low the infection will not clear up. After medicinal treatment has been tried with no avail, then catheter drainage and renal lavage must be considered. Renal lavage has been carried out with many different solutions; the ones most used are flavine and brilliant green, gentian violet, aluminum acetate, mercurochrome-220 soluble and silver nitrate, the last two being by far the most popular. Hundley uses a solution of silver nitrate, from 1 to 2 per cent. In addition to this local treatment, it is of great importance to see that there are no foci of infection. In several of Hundley's cases, the infection cleared up promptly after the removal of abscessed teeth and diseased tonsils. The number of treatments varied from one to ten. Of twenty-five adults with chronic infection, twelve were cured; that is, the urine was sterile and free from pus. The remaining patients were greatly improved, so much so that they would not return for further treatment.—*Journal American Medical Association*, Feb. 27, 1926.

INDUCTION OF LABOUR

By W. A. G. Bauld, M.D.

Montreal

THE induction of labour in the third trimester of pregnancy in the interests of the child or of the mother, or of both mother and child is a problem which the obstetrician must face in about 3 per cent of his cases. There arises always a doubt how this can be most wisely accomplished, and the object of these notes is to survey briefly the methods and results in dealing with these cases.

The indications for induction of labour fall broadly into four main groups, namely: (1) The disproportion group; (2) The toxic group; (3) The hæmorrhage group; (4) The group in which pregnancy is complicated by cardiac, pulmonary or other extraneous conditions.

If one may lay aside for the moment the more radical surgical methods of delivery, such as Cæsarean section, vaginal or abdominal, there remain four well established methods by which labour may be induced and delivery effected.

A brief discussion regarding these methods and their applicability to the indications in each of these groups may be of assistance when faced with the necessity of inducing labour.

Method 1.—The therapeutic method is based for its effectiveness on the administration of a large dose of castor oil and quinine, with the object of sensitizing unstriped muscle, followed by the subcutaneous injection if necessary of pituitary extract for its specific action on the uterus. This procedure has been found frequently successful in determining a well organized labour. The effect of this method appears to be most certain as the pregnancy approaches maturity, but it has frequent failures. The method is attractive from its ease of application, but there are serious dangers to be anticipated. Too strong an action of the pituitary extract may lead to disastrous effects on the child and produce alarming symptoms in the mother—symptoms which may become serious. To this method there are distinct contra-indications in the toxic group; it is obviously unwise in any patient suffering from hæmorrhage until suitable local measures have been taken to control the bleeding. The method can have only a very limited use in any patient suffering from cardiac and pulmonary complications. Not infrequently the oil and the quinine are sufficient to bring about the desired effect without the addition of pituitary extract and the dangers associated with its use are avoided.

Those who have had experience with this method will agree with me that although the effect is sometimes brilliantly successful, the dangers are too serious to risk its free use; it should be employed only cautiously and in selected cases.

Method 2. — *Rupture of membranes.* — This method is simple and almost certainly effective in establishing labour in a short time. It may be assisted by cautious stimulation of the uterus by suitable agents notably quinine and pituitary extract. Its disadvantages are that it establishes a "dry labour" with the consequent increased difficulty to the mother and danger to the child. We can most effectively use this method in the cases with hæmorrhage; namely those with lateral and marginal attachment of the placenta and in cases of accidental hæmorrhage. Hydramnios is best handled by this simple method.

Method 3.—Bougie and pack.—This has long been a favourite method of inducing labour. It depends for its effectiveness on the introduction of a bougie between the membranes and the uterus, and a gauze pack of the cervix and vault, causing a local irritation of the cervix and stimulation of the uterus with the establishment of labour as a result. The following points are to be noted regarding this method. The starting time is found to average ten to twelve hours (often longer); there are frequent failures, amounting to from 30 per cent to 40 per cent; the dangers of infection are considerable; its simplicity of technique is in its favour, and anæsthesia is seldom necessary; there is less danger of any dislodgment of the presenting part. The most gratifying results are obtained from this method

in the group in which some disproportion exists, and in those in which some systemic complication is present. The effect is slow and uncertain in the toxic group, and not infrequently this method must be replaced by measures acting more promptly, with consequent loss of time, and increased danger from infection. In the hæmorrhage group there is obviously no use for the bougie.

When effective, this method has a distinct advantage in preventing dislodgment of the presenting part, thus affording a more favourable chance for the child. Care should be taken to prevent rupture of the membranes to ensure as normal a labour as possible.

Method 4.—The hydrostatic bag.—This method depends for its effect on the introduction of a rubber bag through the partially dilated cervix, and then filling it with fluid, thus necessarily dislodging the presenting part. The sudden invasion of the uterine cavity, and the local effect on the cervix causes a reaction on the part of the uterus and setting in of labour. The starting time ranges from three to five hours; failures are infrequent; success attends this method in about 90 per cent of cases.

The expulsion of the bag leaving the cervix dilated gives an alternate method of delivery in version, if the urgency of the indication demands it.

This method is valuable in cases with hæmorrhage due to lateral and marginal placenta prævia; in these the bag acts as a local hæmostat. There are serious disadvantages, however, which must be considered. Dislodgment of the presenting part renders the labour for the child more hazardous by the possibility of malpresentation positions and attitudes, and accidents to the umbilical cord on re-engagement. The necessity of an anæsthetic in this method also argues against it.

It offers, however, the most certain and the most rapid available method for inducing labour and delivery. The dangers consequent on dislodgment can be to some extent avoided and a more rapid and certain effect would appear to be gained by introducing the bag on unruptured membranes.

In conclusion, the following observations are justified:

1. That the most *certain* and the most *rapid* method of effecting delivery is by the use of the hydrostatic bag. It is attended, however, by an increased danger to the child.

2. The bougie and pack method is uncertain and slow, but is justified when time is not the urgent factor. It should be early replaced by more certain methods as soon as there is evidence of failure (I should place the limit at twenty-four hours). There is an increased danger of infection.

3. The rupture of the membranes has a specific indication in the management of the group associated with hæmorrhage and in hydramnios.

The alternative to this method is the use of the hydrostatic bag.

4. The therapeutic method, while offering an easy and frequently successful method, should be used most cautiously, and only in selected cases. It may be used with safety in a modified form.

Relation of Anaphylaxis to Immunity.—One of the debated questions in immunology is the relation of acquired hypersusceptibility to acquired immunity. W. H. Wanwaring, Ralph W. Wright and Phil W. Shumaker, Stanford University, Calif., thought to throw light on this question by studying the relationship between the sensitizing antibody and the immune antibodies in the dog, an animal not yet used in such comparisons. They found that the difference between the sensitizing antibody and the immune antibody is not merely a quantitative one. The two antibodies apparently have wholly different physiologic properties.—*Jour. Am. Med. Ass.*, April 24, 1926.

New Antirachitic Substances.—De Bosanyi found that healing of experimental rickets may be induced by certain hitherto unrecognized antirachitic substances. These are: a histon—the globin of hæmoglobin; a diamino-acid—cystine; an aromatic compound—epinphrine, and an alkaloid, pilocarpine.—*Johns Hopkins Hospital*, Jan., 1926.

RECTAL ANÆSTHESIA IN OBSTETRICS

By R. N. Ritchie, M.D.

Medical Superintendent, Montreal Maternity Hospital

SINCE the dawn of history man has sought to assuage grief and pain by means of dulling consciousness, and the joyful reception of any new method for the relief of the pains of labour is the best evidence, that as yet no absolutely satisfactory method has been found. A method suggested by Dr. James T. Gwathmey of New York in 1923 has had such wide success that I wish to bring before you the results obtained by it at the Montreal Maternity Hospital, and incidentally to say that the method owes much of its vogue to the clinical efforts of Dr. John O'Regan, a McGill graduate, now associated with the Lying-In Hospital in New York.

It is claimed for this method that it is satisfactory in 90 per cent of all cases, that it can be used as satisfactorily in the home as in the hospital, and that it is inexpensive especially when compared with gas-oxygen analgesia. It requires no special training to give either the necessary injections or instillations, and the constant attendance of a physician during its exhibition is not necessary. The drugs used have been tried out in other fields of medicine, and the method here advocated has been used during the past two years in 1500 cases in the Lying-In Hospital in New York.

Its use is not contraindicated in heart disease, in toxæmia, or even in cases with placenta prævia, but is contraindicated when dealing with patients suffering from colitis, true diabetes, or subject to auditory disturbances. It is suggested that the ether is a factor in relaxing the perineum, and that labour is not prolonged even in occipito-posterior positions, while asphyxia of the fœtus is not noted more frequently than when the method has not been used. Finally there is no subsequent rectal irritation.

Our experience with this method at the Montreal Maternity Hospital has been limited to some seventy-two cases during the past year. All of these were primiparas. In fifty of these cases the method was an unqualified success both for the mother and child, in eleven the result was not quite so successful while in the remaining eleven there was practically no success. In all but three of these cases labour terminated spontaneously, and the three exceptions were delivered by a low forceps operation. Six of the babies were apnœic at birth but required no resuscitation; five required resuscitation, three of them being those delivered by the low forceps operation noted above.

It is suggested that the ease of administration and the great frequency of complete success with uniform absence of ill results, not to mention the cheapness of the materials involved, commends this method of anæsthesia for trial by the profession at large. The drugs required are:

1. Ampoules containing 2 ccm. of sterile 50 per cent solution of magnesium sulphate.—Four may be necessary.
2. Hypodermic tablets of morphine sulphate grs. 1/6.
3. A retention enema—

Quinine hydrobromate.....	20	grs.
Alcohol	3	drachms
Ether	2½	ozs.
Olive oil of good quality up to...	4	ozs.

The alcohol and quinine are first mixed, then add the ether, after which enough olive oil is added to make the total quantity as indicated. The mixture is stirred, strained through cotton into a bottle, and tightly corked. At room temperature this should remain stable for at least a month.

Apparatus:

1. Glass syringe to contain 5 ccm.
2. Needle for syringe; gauge 19; 1½" long.
3. Rubber catheter, size 20-22, French, preferable red rubber and fairly stiff.
4. A small glass connecting tube.
5. 5 oz. funnel with a further 20" rubber

tubing, and an artery clamp to control the flow.

Method of administration.—When the patient is definitely in labour the usual soap suds enema is given. This must precede the rectal anæsthesia by at least two hours. With the cervix from 3-5 ccm. dilated and the pains regular, the first hypodermic morphine grs. 1/6 together with 2 ccm. magnesium sulphate solution, may be given. The best time for this injection is during an actual pain. As the morphia is not readily soluble in the magnesium sulphate solution it should first be dissolved in sterile water, and this solution mixed in the syringe with the contents of one of the ampules. The site of the injection should be cleansed in the usual manner and the injection made deeply, not just under the skin.

After this injection the patient should be kept absolutely quiet. Cotton wool in the ears is advisable, and attendants should avoid loud talking or unnecessary disturbance of the patient, who under the most favourable circumstances will sleep, but requires watching lest during the contractions she should be unusually restless.

One hour after this injection, a further 2 ccm. of magnesium sulphate solution is injected, irrespective of whether the first has apparently acted as a sedative or no. This indeed may be repeated a second or even third time. In our series a second injection was given thirty times, and a third twice. The object of this is to prolong the action of the morphine.

The ether instillation is given approximately two hours after the first hypodermic injection, and should not be given too early as there is danger of retarding labour if it is given too soon, and indeed if the effect of the magnesium sulphate solution is sedative the injection may be withheld until this effect has almost worn off.

The bottle containing the mixture of ether and olive oil should be warmed to body temperature, then with the patient on her left side, the buttocks at the edge of the bed, vaseline should be applied freely in the region of the anus so that if the ether is expelled there will be no burn. She should be advised not to bear down but to breathe deeply with the mouth open, which will prevent expulsion of the solution, and also to draw up with the sphincter as if to avoid expelling gas, which will induce reverse peristalsis and will permit the fluid to run in more readily.

When it is evident that the oil and ether are retained a third intramuscular injection of 2 ccm., 50 per cent magnesium sulphate is given for the purpose of prolonging the action of the ether. Should the effect of this first instillation wear off and the patient complain of pain, a second or even third four ounces may be given at intervals of two and a half hours or more. Each of these is accompanied by an intramuscular injection of 2 ccm., 50 per cent magnesium sulphate solution. One should not be misled, and this particularly in multiparæ, by the quiet appearance of the patient, for though she is quiet, labour may be progressing rapidly, and constant supervision is essential.

The morphine is essentially quietening and relieves the pain. The ether is distinctly analgesic and undoubtedly helps to dissolve the quinine, which has an undoubted effect upon the intensity of the uterine contractions. Absorption of the quinine from the rectum is evident from the fact that after labour patients complain of buzzing in the ears, evidently due to its absorption. The olive oil prevents irritation of the rectum and allows slow even evaporation of the ether at body temperature. The magnesium sulphate acts synergistically with the ether in producing analgesia and anæsthesia and also definitely prolongs the action of the ether and morphine. It causes paralysis without preceding excitation. The central nervous system is affected before the peripheral nerves, therefore pain and consciousness are affected first; much larger doses are required for paralysis of the motor nerve endings.

SYMPOSIUM ON OBSTETRICS—SOME END-RESULTS*

By W. W. Chipman, M.D.

Montreal

THE subject of obstetrics was from the beginning and for many years the despised sister, the Cinderella of any medical curriculum; its rightful equality with its two proud sisters, medicine and surgery, has only been established in recent times. The reasons for this are apparent; I shall not enumerate them, but will merely mention the following historical facts. In Great Britain, it was only in 1869 that midwifery became an essential, and a compulsory part of the medical course. In the United States, clinical instruction in obstetrics was begun only in 1850, by James P. White, of Buffalo. In Canada, while the Montreal Lying-in Hospital, the forerunner of the present Montreal Maternity, was opened in 1843, sixteen years after the founding of the McGill Medical School, clinical teaching therein was only begun four years later, in 1847, when there were eight students in attendance.

It was not till 1854 that the teacher of obstetrics in McGill became the Medical Officer of the Hospital. Accordingly, McGill ranks as one of the older English schools, both in the just recognition, and the clinical teaching of this subject.

The work of an institution, or a man, is to be measured alike only by its results. Last September the present Montreal Maternity Hospital completed twenty years of service. During that time 19,987 mothers were delivered in its indoor service; while 6,140 were so treated in the outdoor; *i.e.*, in their own homes. The total of these is 26,137, quite a considerable city, and a city in the full strength of its youth.

The average maternal mortality during these years was 0.9 per cent (in the outdoor there was but one maternal death). During one year, *viz.*, 1924, this mortality fell to 0.14 per cent, our most fortunate year. These results are good. As proof of this, I shall compare the mortality returns in several American and Canadian hospitals, for the year 1923, as published by Professor Tottenham, of the University of Hong Kong, in the *Irish Journal of Medical Science*, of last November.

	No. of deliveries	*Percentage Mortality*
The Toronto General Hospital..	1,293	1
Boston Lying-In Hospital.....	1,133	2.2
Johns Hopkins Hospital.....	875	0.7
New York Lying-In Hospital..	3,511	0.9
Montreal Maternity Hospital....	1,354	0.5

The outstanding features of this twenty years of service may be summarized in the following way:

1. *An improved technique.*—the avoidance of puerperal infection—that dreaded infection, "which is puerperal in time, pelvic in place, and infective in origin." This we know from our mortality and morbidity returns. Last year, 1925, our mortality rate was only 0.26 per cent, and none of these four deaths were due to sepsis.

2. *Ante-natal care* is undoubtedly the most conspicuous feature of these twenty years. This ante-natal care was first advocated in English-speaking countries, by the late Dr. J. W. Ballantyne of Edinburgh, thirty years ago, and it really constitutes the greatest advance in modern obstetrics. This is actually the way of our salvation, for by this means the obstetrician is now wise in time regarding the impending event; the emergencies are minimized, and catastrophes are avoided. Forewarned is forearmed, and this is never truer than in the practice of obstetrics. Our hospital records show the advantage of this ante-natal care by the admission in recent years of a steadily diminishing number of the grave emergencies—the cases *in extremis*.

3. *The increased use of hydrostatic bags.*—

(a) In placenta prævia,

(b) In the induction of labour in the toxæmias, and in minor degrees of pelvic contraction.

4. *Improved methods in the treatment of eclampsia*:

(a) As regards prophylaxis and its early recognition,

(b) In the treatment of the actual condition

* Contributed to a Symposium, Montreal Medico-Chirurgical Society, April, 1926.

itself. For, as regards this treatment, no longer is the pregnant uterus emptied at once and at any cost. Rather, on the other hand, is the condition of eclampsia first treated by morphin and venesection, by gastric and by bowel lavage, and the pregnancy is permitted for the time to take care of itself. In this way the results both for mother and child have been greatly improved

5. *Cæsarean section.*—a gradually increasing number. This is natural enough. In the 1935 confinements, Cæsarean section was employed twenty times.

The above have been the special tendencies during these twenty years. In a general way I may say that a hospital service in obstetrics has become much more common and much more popular. There are few of us who will quarrel with the following statement: That it is wise for a primipara to be delivered in a hospital. For the mother, the child, and the physician, this first parturition is by way of an untravelled road, and it is always difficult to forecast this initial journey. The ideal labour remains the spontaneous one, and any departure from this is really a confession of failure, a measure of imperfection. On the other hand, any method of interference, when rightly enacted, is, in a strict sense, prophylactic; a prophylaxis for the mother or for the child, employed as it is, to protect these two from death or disablement. We still live in an imperfect world.

Last year, 1925, 1,494 mothers were delivered in the indoor service of our hospital, and 441 in the outdoor, a total of 1,935. In the indoor cases (1,494) artificial interference was employed 215 times, and in the following way: forceps were applied 128 times; version and extraction were done eleven times; the breech presented and the child was so delivered fifty-six times; Cæsarean section was employed twenty times.

In the outdoor service, 441 deliveries, forceps were applied three times; version and extraction one time; the breech presented, and the child was so delivered fourteen times.

This means that in 1,935 cases, but 233 demanded and received artificial help in their deliveries. When this number is subtracted, there remain 1,702 cases wherein the labour was concluded spontaneously; *i.e.*, in 90 per cent the delivery was spontaneous. I need not tell you that such figures bespeak a masterful conservatism in practice; the wisdom whereof is justified not only of her children but by her children.

Like everything else, obstetrical practice is always to be measured by its results. In our own community in recent years, we seldom meet the severe birth-injuries that were not so uncommon in the former days. I refer to the deep cervical laceration, involving the paracervical, or even the parametric tissue; to the complete perineal tear; and to the bladder and bowel fistulæ. These injuries are now but seldom seen, and their absence testifies to improved methods in practice.

These conservative methods are, unfortunately, not yet fixed or universal. There still blow many winds of doctrine. Still we hear the boast of the advantage of the routine abrogation of the second stage by a version and extraction; or by the use of the so-called prophylactic forceps. In a word, the boast of a vicarious labour on the part of the obstetrician. A dangerous practice this, and a still more dangerous teaching, for in unskilled hands such measures are inevitably disastrous, and they may be even criminal.

As a living proof of this, there were seen this year in one clinic (not in Canada) four young mothers, mutilated beyond hope of complete repair. These injuries were extensive vesico-vaginal fistulæ, the result of the premature and ill-judged use of the midwifery forceps. These four mothers were all young, in the twenties; the injuries had occurred at their first confinement, there was no pelvic contraction or deformity, and during this forced delivery their babies had perished. Already they had undergone repeated operations for the repair of these large fistulæ. In two of them, bladder control was still incomplete, while in two a urinary continence had been finally secured only by a complete closure of the vulvar orifice, and the formation of a recto-vaginal cloaca. Truly a pitiable condition—their babies were dead and lost even as was their own image.

And yet these women had all been delivered by qualified practitioners. We may say with Whitridge Williams, "how much safer sometimes is the woman in the hands of the midwife or even in no hands at all." In the practice of obstetrics, nothing can be worse than an untimely, a premature interference.

THE IMPORTANCE OF SPECIFIC POLLENS AND THEIR OPTIMUM DOSAGE FOR DESENSITIZATION IN HAY-FEVER

From an Experience of Five Years

By Daniel Nicholson, M.D., M.R.C.P.

Assistant Professor of Pathology, Faculty of Medicine, University of Manitoba

Assistant in Pathology, Winnipeg General Hospital

ONE of two methods may be adopted in diagnosing the cause of hay-fever. The first would be to have several dozen test pollens and spend an hour testing out a patient's reactions. The other way would be to employ the few tests supplied in the outfits which are given free by some company who hopes to sell pollens for treatment. Such companies usually give first place to the advertising of "early summer and late summer sets", which are supposed to contain anything the patient might be sensitive to but often do not do so.

The relative merits of these methods can be best illustrated by referring to folders sent out by such large manufacturing houses in which they give advice to first determine by cutaneous tests the type of hay-fever from which the patient is suffering. If it is the spring type, timothy pollen extract should be applied in diagnosis: if it is the autumnal type ragweed pollen extract, but if the symptoms last all summer both extracts should be used.

H.B. was tested out in this way. He showed a reaction to timothy (Phelum pratense) but not to ragweed (Ambrosia elatior) and started treatment on May 1st. On June 5th the hay-fever reappeared and kept up all summer. Next April he was tested out to a full list and showed the following reactions, June grass (Poa Pratensis) XX, timothy X, sage bush (Artemisia tridentata) XX, dandelion (Taraxacum officinale) XXX. A series of injections of a mixture of these resulted in very marked improvement in his condition. Occasionally he would sneeze on waking in the morning but was always free during the day. This is the type of case that requires a complete test list. It is true that in a patient who was sensitive to timothy alone a satisfactory result would be obtained by the injection of that extract only, but a large number of patients who are sensitive to timothy are also sensitive to the roadside grasses such as June grass. Although June grass and timothy are both members of the grass family they are of different tribes and desensitization with timothy will give very poor results in a patient who is sensitive to both. Their relationship is too far removed.

In a patient who shows marked reaction to June grass and moderate reaction to red top (Agrostis alba) and orchard grass (Dactylis glomerata), good results will be obtained from using the June grass pollen extract only. Pollen reactions are not the same to various members of a plant family although if one produces a very marked reaction, the others will usually produce a slight reaction. If they produced equal reactions one could make a test for the commonest member of each family and so the work of testing out would be lessened. But this is the type of work that leads to wrong diagnoses and poor results from treatment.

Again, this patient was also sensitive to dandelion, a plant of the Compositæ family. The ragweed is a member of the same family, although they are not very closely related and I have seen many cases give a marked reaction to one and none to the other. Here again is ample proof that the individual pollens must be used in testing reactions.

I have seen twelve cases who showed a reaction to dandelion alone. Ten of them were markedly improved by injections of the dandelion pollen extract and two slightly improved. It is generally thought that dandelion pollen being heavy and sticky is pollinated by insects and bees only, and does not cause hay-fever and asthma. There must be an emanation that rises from these plants because in sensitive

cases the symptoms appear as soon as the flowers open in the spring. The worst symptoms however, occur when the bloom has withered and the fluff blows about. Usually the plants that pollute the air most with pollen have little or no blossoms and have to depend on the wind entirely for pollination. The best example is the ordinary roadside grass.

A study of the reactions occurring in late summer shows much the same state of affairs. Ragweed is the worst offender. There are at least four varieties of ragweed and several false ragweeds. The reactions obtained by the various members of this group are more uniform than members of the grass family, although one may obtain a marked reaction to the giant ragweed (Ambrosia trifida) and in the same patient obtain only a slight reaction to the short ragweed. A person who shows a very marked reaction to one of the ragweeds will show little or no reaction to one of the less closely related members of the family such as cocklebur (Xanthium speciosum) and sagebrush, and here again individual tests for each of the pollens are necessary.

It may be asked why the few pollen tests and treatments continue to be used. The pollens in these outfits are the commonest offenders and their use will result in a moderate percentage of good results. It is a fact that benefit has been obtained by the injection of a bacterial vaccine in hay-fever due to a specific plant pollen, but the percentage of good results by such treatment is very small. Hay-fever is a very specific disease and for a high percentage of good results specific treatment should be used.

The choice of tests to be used is greatly aided by an actual knowledge of the plants in the vicinity. This knowledge is a valuable time saver because most patients are able to tell just when their hay-fever starts and stops. With some knowledge of botany, one will know the plants pollinating at that time and so the list of tests may be lessened. Also patients will sometimes state that in certain localities only are they troubled. Here again a knowledge of the special flora of that locality is valuable. Rarely, a very observant patient will actually bring the plant that is causing his or her trouble.

Another aid of considerable value is the use of an ordinary microscopic glass slide smeared with glycerine and left on the window ledge for several hours to catch the pollen which pollutes the air. This slide can then be examined under the microscope for the type of pollen grains present. From this examination one cannot often name the exact plant because the pollens of all the plants in the grass families are very much alike. Also the pollens of all the ragweeds are quite similar. One can however, distinguish the pollen not closely related to each other, such as ragweed from sagebrush.

One should not forget that reactions can be obtained by rubbing the central part of a flower, the stamens and pistil, into a scratch with a toothpick. The defect of this method is that one has to wait till the flowering season is on before the tests can be applied in this manner. It is however, a useful point to remember because most hay-fever patients consult their medical adviser for the first time while having symptoms and if one's stock of prepared concentrated solutions does not give a reaction, other plants thought to be offenders may be tried. If a reaction is obtained, the plant can be identified and an extract for treatment procured.

The quickest method of doing tests is to make about twelve scratches at one time and then drop the concentrated pollen extracts in them, placing the used vials or tubes in a row on the desk so that if the fifth tried gives a reaction, by counting down the row the fifth can be identified and recorded. After all the positive reactions have been determined the next point to decide is whether one or several pollens shall be used in the treatment. If the pollens of two plants not closely related give a marked reaction both should be included in the extract for treatment. If several pollens of closely related plants show reactions, one very much greater than the others the greater may be chosen and a vaccine prepared from it alone.

Treatment.—It is of the utmost importance to use a dosage that is not too large and give treatment over a period of two or three months, beginning three or four weeks before the pollen to which the patient is sensitive begins to pollute the air.

The solutions for treatment are usually put up in vials of serial solutions, 1-1,000, 1-5,000 and 1-10,000. Place a drop of each of these

in skin scratches. As initial dose give subcutaneously 0.1 c.c. of the dilution that gives a reaction less than ⅛ inch in diameter by the scratch method. Next to incomplete diagnoses of the offending pollens the giving of too large and too few doses is the greatest cause of unsatisfactory results. This very important point will be forcibly illustrated by relating an actual experience. An out of town patient who was sensitive to June grass and timothy requested material for treatment. I prepared two solutions, one containing 1 in 1,000 of June grass pollen and a like amount of timothy pollen and the other containing a 1-10,000 dilution of both of these pollen solutions. With these were sent the following directions to the doctor who was to give the treatments:

SCHEME FOR TREATMENT

Keep pollen vaccine in a cool place. Give three hypodermic injections weekly of 1-10,000 according to the following scale:

.1	c.c.	or	1	minim
.15	"	"	2	minims
.2	"	"	3	" "
.3	"	"	5	" "
.5	"	"	7	" "
.7	"	"	11	" "
1.0	"	"	15	" "

Then give two injections weekly of 1-1,000 as follows:

.1	c.c.	or	1	minim
.15	"	"	2	minims
.2	"	"	3	" "
.3	"	"	5	" "
.5	"	"	7	" "
.7	"	"	11	" "
1.0	"	"	15	" "
1.2	"	"	18	" "
1.4	"	"	22	" "
1.6	"	"	24	" "
1.8	"	"	27	" "
2.0	"	"	30	" "

Doses can be most accurately measured by a 1 c.c. tuberculin syringe. The reactions of individuals vary. When they are very sensitive the dose must be diminished. If there is any general reaction or if the local reaction is more than two inches in diameter, decrease the dose to half the last given and work up again at half the rate on the suggested scale. The essentials to successful desensitization are, treatment before the plants pollinate, beginning with a small dose which is gradually increased over a long period of time.

I saw the patient about two months later. He had taken four injections and because the reactions were so severe, the doctor thought is best not to give any more. On inquiring, I found that when 0.1 c.c. was given an œdema about five inches in diameter and one to two inches high developed. Instead of following the directions and decreasing the dose twice that amount was given. The last dose given was 0.4 c.c. of 1-10,000 and a huge œdema with pain in the axilla developed.

At the time that I saw him 0.1 c.c. of the 1 in 10,000 diluted ten times, that is 0.1 c.c. of 1 in 100,000 injected subcutaneously produced a swelling about one and one half inches in diameter and one half inch high. This I considered a maximum dose to start with. As I did not see the patient after I do not know what the ultimate result was. It was an example of how, in a patient who is extremely hypersensitive, faulty treatment will yield no benefit and so bring specific desensitization into discredit.

The reaction occurring in protein desensitization is quite different from that of the ordinary bacterial vaccine which usually appears the following day or later. On injecting a specific protein the reaction begins in a few minutes. In half an hour it is at its height and in six hours it is usually over. For this reason it is permissible to give the first dozen injections at daily intervals. The next six are given every second day and the remainder twice weekly. After a break of over a week in the treatment, one should begin at half the amount last given. If the time is limited the first dozen injections may be given twice daily with this precaution however, that the effect of the last injection must be passed before the next is given.. This method is the most satisfactory for a patient who is suffering from an attack at the time of treatment and usually in less than two weeks the symptoms lessen very much or entirely disappear. It is very easy to aggravate the symptoms by giving a dose that is too large.

There is some difference of opinion as to whether the treatment should be stopped when the pollen season begins or whether the patient should receive injections throughout. It may be permissible to stop treatment at the beginning of the pollen season if it is short, but I have found it better, especially with the ragweed and sagebrush cases, to continue weekly injections throughout the season. The amount should not be increased; it may even be slightly lessened.

The details of one case which illustrates a number I have seen will show the result of not continuing injections.

The patient was thirty years of age and for twelve years had suffered from hay-fever which started on August 1st and lasted until the frost came. Cutaneous tests showed reactions to willow (Salix fragilis) XX, Russian thistle (Salsola pestifer) XXXX, Western ragweed (Ambrosia psilostachya) XXX. A solution of the Russian thistle and ragweed pollens was prepared and treatment started by July 1st and continued until August 5th. He was entirely free till the first week in September when the hay-fever started in with the usual severity. Next season he continued to take ¾ c.c. of 1-1,000 weekly all through the season and was free of symptoms throughout the entire season.

It is difficult to say how many preseasonal courses of treatment will give a permanent immunity. Rarely in patients who have had one course of treatments there has been no return of symptoms. At times, after two or three courses the patients have no further trouble. There are very many cases who require preseasonal treatment every year and this treatment although it will prevent hay-fever for the immediate season lessens their cutaneous reaction very little.

Summary

1. The list of test pollens should be as complete as possible.
2. The reactions of pollens from the same plant family vary.
3. A knowledge of the plant flora and their time of pollination is valuable.
4. The blossom of a plant to which a person is sensitive rubbed into a scratch will produce a reaction.
5. Essential to successful desensitization is preseasonal treatment beginning with a small dose which is gradually increased over a long period of time.
6. Injections should be continued throughout the pollen season.
7. It is difficult to say how many courses of preseasonal treatment will confer permanent immunity.

HIGH BLOOD PRESSURE AND ITS TREATMENT BY THE HIGH FREQUENCY CURRENT*

By H. Rundle Nelson, B.A., B.A.O., B.Ch., M.B., M.D. (Dublin), L.M. (Rotunda)

Radiologist St. Joseph's Hospital, Victoria, B.C.

PATIENTS presenting symptoms of high blood pressure or increased vascular tension may be divided into two groups: those with hypertension, and those with hyperpiesia. The first group includes those cases of persistently elevated systolic and diastolic pressure in which there is a discoverable vascular lesion, in other words a known pathology; the second group includes all cases of increased blood tension without discoverable cardiovascular lesion.

Hyperpiesia is usually the precursor of hypertension; it may be traced back very many years in a patient's life, even into childhood, and it always leads on to the development of cardiovascular lesions unless treated; it takes many years to produce its ill effects, and is very insidious. The argument that an increased arterial tension is compensatory, and should not be combated does not always hold good as the condition may have existed long before the cardiovascular changes took place. It would be well to make a practice of taking the blood pressure of every patient no matter what their ailment may be, as, if one waits for symptoms such as headache, dizziness, digestive and urinary disturbances to occur, the condition will have passed on into the stage of hypertension, and the mischief is already done.

Blood pressure is dependent upon six factors: heart force, end resistance, elasticity of the vessel walls, amount of blood, viscosity of the blood, and vasomotor control. These essentials vary widely in the part they play, but observ-

* Paper read before the Victoria Medical Society, Victoria, B.C., March 1, 1926.

ance of them may help toward an early diagnosis, and more efficient treatment.

The normal blood pressure.—No arbitrary figure can be set for this as it varies with the individual's build, probably more than anything else. A short thickset man of the same weight as a tall thin man will have a higher blood pressure normally. The systolic pressure minus the diastolic gives the pulse pressure, and these three should be in the ratio of 1, 2 and 3. That is a pulse pressure of say 40, a diastolic of 80 and a systolic of 120, and for insurance purposes a systolic pressure of between 114 and 142 for healthy men has been accepted by the Mutual Life Insurance Company of New York. These figures are based upon 150,000 risks which were accepted. This variation is scattered over all ages and forms of the figure.

Age has perhaps least to do with the pressure, provided the individual has lived a normal life, and the normal pulse pressure varies in adult individuals regardless of age, sex and build from forty to fifty. Grover says that "there is no good reason for an individual at the age of seventy years, who has passed a normal life, to have a blood pressure materially higher than one at twenty-five years of age. The energy index or total amount of energy expended by the circulatory system is important. It is obtained by adding the systolic and diastolic pressures together, and multiplying by the pulse rate. The maximum index consistent with safety is 20,000 m.m. of Hg. The normal ranges from 13,000 to 20,000. When less than 13,000 cardiovascular weakness is suggested; when over 20,000 an excessive load is being carried.

One should make a practice of always taking the pressure in the same way, that is always take the patient sitting down and always take the left brachial artery, as there is a small difference between the right and the left side, and also between the different positions of standing, sitting, and lying down.

Causes of high blood pressure.—Of the passing causes of alteration in the pressure, pain, anger and excitement will cause a temporary rise, while a fall is caused by sleep and fear. The causes which are of a permanent character in producing hyperpiesia are for the most part toxins circulating in the blood, and exclusive of certain specific toxins, they are of gastro-intestinal origin. Intestinal stasis weakens the natural defence of the intestinal mucosa against bacterial invasion, hence, absorption of toxins is apt to be followed by vasomotor disturbance and hyperpiesia. Other toxic agencies are unhealthy tonsils, teeth and other focal infections. Overactivity of certain glands such as the adrenals and pituitary also often cause an increase in arterial tension. Long continued and chronic infections cause hyperpiesia, but acute infections frequently cause hypotension. Allbutt says of hypertension, "that we know nothing of its causes. It seems to be a disease of the well-to-do class or those whose fathers have indulged in good appetites." He believes heredity to be a factor in its cause, and says that alcohol, save when taken too freely, had little or nothing to do with the causation of hyperpiesia. In the *British Medical Journal*, December, 1925, he says, "D'Arsonvalism is the one means known which does influence high pressure, and is the most valuable aid we have in hyperpiesia; even if the lowering of pressure is temporary, something has been gained." Humphries gives a good analogy in an elastic band with a weight suspended by it. This represents the resilience of the arterial tree and its load or pressure. If you take the weight off every few days and give the elastic a rest of some hours, and then replace it, the elastic will last much longer than if never relieved of its strain, and the same applies to the arteries of our bodies. Ill-advised exercise especially in the young adult is a frequent cause. How many great athletes die of heart failure? The mental condition has a great deal to do with stability of the vascular system, and hence has an effect on the blood pressure, for the prime changes in the lumen of the vessels are principally, if not wholly, due to the action of the vasomotor mechanism.

From this it will be easily seen how the improvements are brought about in treating these cases with the high frequency currents as they have a very decided and reliable action in promoting vasomotor dilatation, by enlarging the lumen of the small vessels; the capacity of the whole arterial tree is increased and as there is the same amount of blood present in this reservoir, the tension must be, and is lowered wherever this action is able to overcome this exciting cause. Of some thirty cases which I have treated within the past year, there were only two whose pressure I could not lower even after prolonged

treatment, one was a man, the other a woman, both were very highly strung and it was the stronger influence of their mental condition, I feel sure, in both cases, that prevented the vasomotor dilatation taking place.

Of these thirty cases more than half were directly traceable to focal infection from teeth, tonsils or other more hidden focus; some were attributed to liver derangement and intestinal stasis, and one to neuritis; the prolonged pain was apparently a cause, as the two conditions disappeared or reduced together.

As to the length of a course of such treatment I can only say it depends on results. Some patients respond rapidly even to the first treatment, but I do not aim to make a reduction of more than ten or fifteen m.m. at one sitting, as too rapid a reduction is not good for the patient. A rapid release of toxins takes place after a successful treatment, and a patient will then complain of a tired feeling. I always warn the patient of this, and advise a good dose of castor oil, or other purgative which frees the system from these toxins, and the patient feels much better. There is a second way in which the current acts, *i.e.*, by metabolism. It is sometimes necessary to give six or eight treatments before any appreciable lowering of the blood pressure is observed, but once it sets in it usually progresses with each treatment. When the normal for the patient has been reached, and kept steadily for a series of four or five treatments, the patient is discharged, but asked to return in six weeks or earlier, if symptoms suggest a rise. If the pressure has gone up again, a few treatments usually bring it down again, but observance of the case is indicated for six months to a year.

I base the strength of current used on the general assumption that a patient weighing 150 pounds will absorb 500 milliampere, and use this as my guide. I begin with a smaller current for about ten minutes, and await the result, as I have had patients not only complain of tiredness, but even vomiting and sleeplessness in the early stages of treatment. Castor oil then lends its aid and the treatments can be lengthened in time, and in current strength up to twenty minutes. At times it will be found that the increase of current either causes a small rise in pressure or no effect at all, and then it is best to reduce the current, and lengthen the time even up to thirty minutes, when good results usually are obtained.

The patient feels nothing at the time of treatment except a pleasant sensation of warmth, and this is first felt in the wrist and hands holding the electrode, the blood is warmed, and is felt in these narrowed channels, and the hands will be found to be quite damp when the electrode is removed; a general small rise of body temperature will also be found present.

Chiropractic Not Harmless.—A decision by the Supreme Court of Illinois relating to chiropractic has brought out a new answer to the claims of chiropractors and practitioners of similar methods. The defendants in the case argued that practice of chiropractic was "a useful and harmless calling which cannot be regulated by the state." This claim was declared to be so entirely without merit that any discussion of it was unnecessary. The decision went on to state, however, that "if a chiropractor can, by manipulation, move a dislocated vertebra so that the pressure on a nerve can be relieved and paralysis cured, he can by the same process dislocate a vertebra and cause a paralyzed condition. Any method of treating human ailments which, when practiced skilfully can restore a diseased human body to health is capable of doing great harm when practiced without care or skill. A method of treating human ailments cannot be both useful and harmless. If it is sufficiently efficacious to be useful, it is at the same time capable of producing harmful results." The chiropractor, no less than the physician or any one else who is to treat the sick, needs to have a sufficient training in the fundamentals of medicine so that he will know at least when his manipulation may be harmful.—*Jour. Am. Med. Ass.*, Feb. 13, 1926.

Case Reports

COMPOUND DISLOCATION OF THE LOWER END OF THE ULNA

By S. Harvey Corrigan, M.D., C.M.

Lampman, Sask.

and Cecil Edwin Corrigan, B.A., M.D.

Winnipeg

It would seem improbable that in a rural hospital of twelve beds, unusual incidents of injury would occur. We feel that we have met with and been able to record not a few.

Simple dislocation of the lower end of the ulna, uncomplicated by fracture of the radius, is so rare that it is said no surgeon has seen more than one case. Gibson of Winnipeg, in a very concise and complete paper on this injury, *Journal of Bone and Joint Surgery*, January 1926 vii, 180, finds records of only thirty-seven cases. To these he has added a recent case in his own practice. We believe his paper constitutes the latest thorough review of the subject. All authors agree that simple dislocation occurs much more frequently in association with a fracture of the radius. The reasons are obvious.

In the summer of 1925 when we were confronted with a compound dislocation of the lower end of the ulna, with simple fracture of the radius, we believed the condition must be very rare.

The editorial office of the *Journal of the American Medical Association*, responding to inquiry, stated that in its search it found no mention of any case of compound dislocation of the lower end of the ulna. The *Index Medicus* to date gives no reference. Several recent editions of works on fractures and dislocations, as well as works on general surgery, fail to mention the matter. Gibson's paper does not mention the compound dislocation.

Incidentally, we learned from Dr. John E. Corrigan of Spooner, Minnesota, that he heard Stimson discuss this injury in New York over thirty years ago, and in Stimson's *Fractures and Dislocations*, edition 1900, page 674, we read: "In an entirely unique case reported by Valleteau, *Gazette Medicale* 1836, page 250, the dislocation—forward—was compound. The patient's forearm had been caught in the spokes of a revolving wheel. The ulna projected twenty-eight lines through the skin, crossing the front of the radius, which appears not to have been broken. Again—"The serious complication of perforation of the skin by the ulna, has occurred only once, except in connection with the fracture of the radius." This is the only record we have found of a case of compound dislocation of the lower end of the ulna without fracture of the radius, and the only intimation that such injury has been observed in association with the fracture of the radius; but even here is no record of specific cases, of the latter condition.

Our patient, No. 195, Lampman Union Hospital, 1925, was injured by a back-fire while cranking his automobile engine. In such cases the injury is usually of the Colles' type. In this case, however, there occurred a long oblique fracture of the radius, well above the extremity, the line of fracture running from above and externally downwards and inwards with the arm in supination. Four centimeters of the ulna protruded through the anterior aspect, stripped clear of attachments and with the styloid process intact. The parts still carried evidence of soiling from material in the farm yard, where the accident occurred. The force producing this unusual type of injury developed thus. The engine having back-fired, continued to reverse, and the crank re-

maining connected, its hand piece struck the arm on the posterior-radial aspect. The hand acting momentarily as a counterweight, the radius was fractured and the ulna forced to an open dislocation.

Treatment.—Under ether, a prophylactic dose of antitetanic serum was given and the parts carefully cleansed. The opening was enlarged downward, and the bone was easily restored to its normal position. A Carrel drain was fastened in the injured area and continuous irrigation was maintained. Passive movements were begun early. The treatment was carried on without x-ray guidance. The alignment is not good, but the patient has a functionally correct arm, wrist and hand.

Reduction, in Gibson's uncomplicated case, called for open incision. He approached from the posterior surface, sutured the torn triangular fibro-cartilage and obtained a perfect result. With present day methods of combating infection, we believe that similar suturing would have been good in our case.

Compound dislocation of the head of the ulna must have been observed many times. We believe there should be more case reports on record and that textbooks should mention the subject.

AN EXPERIENCE WITH NOVASURAL

By Samuel Marcus

New Germany, N.S.

There have been appearing recently in medical literature very favourable reports on the efficacy of novasurol as a diuretic in dropsy of cardiac and renal origin, and it appears that many clinicians of note have found this drug of undoubted value. Dr. McPhedran, in his address "Heart Disease in General Practice" delivered at the annual meeting of the Medical Society of Nova Scotia at Bridgewater on July 1st, makes favourable mention of it, and the February 1926 issue of the *Canadian Medical Association Journal* devotes an editorial to it. It was these favourable reports from reliable sources that impelled me to use this drug, as a last resort, in a case of advanced cardiorenal disease; but my experience with it in this single case was disappointing. In the literature on the subject that has so far come to my notice, there is no report of a similar occurrence.

On July 25, 1925, I began to treat a woman of sixty-five with advanced cardio-vascular renal disease. For a while her response to digitalis and the ordinary diuretics was favourable, but later these proved ineffective, œdema began to increase, and dyspnœa became very marked. Paracentesis and multiple incisions on the legs afforded but temporary relief. Finally, late in October, as the usual remedial measures proved ineffective, I decided to give novasurol a trial, and my experience with it was as follows:—

On October 27 I administered 1 c.c. of novasurol intramuscularly. This was at noon. At three the next morning I was called to the patient's home. On arriving there, I learned that she had voided at least twenty times since the injection of the drug, that on four or five occasions micturition was very painful, and that on these four or five occasions, she passed blood clots with her urine. (I confirmed the presence of blood by subsequent microscopical examination of the urine passed at that time). I inquired as to any previous similar occurrence, and received an answer in the negative. The patient quieted down after a hypodermic of morphia. During the next three or four days, the diuresis continued, though in a lesser degree, micturition was not painful and no blood appeared in the urine. There was marked reduction in the œdema, and her general condition improved somewhat.

When the diuresis subsided, I decided to give her a second dose of novasurol. This I did, intramuscularly as before, ten days after the first injection (Nov. 6). This time marked frequency was again produced, but no painful micturition or hæmaturia. There was further reduction in the œdema.

Encouraged with the result of the second administration, I gave her a third intramuscular injection of 1 c.c. seven days later (Nov. 13). This time there was a repetition of the symptoms following the first administration (marked frequency, painful micturition, hæmaturia) and although the hæmaturia and painful micturition did not last over twelve hours, they distressed the patient so much that I decided to discontinue the use of the drug. In a few days the œdema began to increase once more, dyspnœa became markedly worse, and the case terminated fatally in December.

From this single experience one cannot draw any definite conclusions, but it appears that novasurol, although undoubtedly a powerful diuretic, is not without its unpleasant effects in

cases such as reported above. Of course, there is the possibility of the hæmaturia in this case being caused by some lesion in the urinary tract, but the non-occurrence of this symptom previous to the administration of novasural would almost rule it out, and its occurrence very soon after its administration would make one very suspicious of novasurol as a causative factor.

Nova Scotia Medical Bulletin, April, 1926

CASE OF HYPERNEPHROMA WITH BONE METASTASES

History and Pathological Report

From the Surgical and Pathological Departments, Queen's University, Kingston, Ont.

History of the case.—A man aged sixty sought advice (September 22, 1925), on account of a lump on the left side of the neck situated posteriorly. The tumour was not particularly sensitive to the touch. Indeed his attention was drawn to it by a friend two weeks before he came to hospital. He also complained of some pain round the lower margin of the ribs and in the back.

The history which he gave was that he had been healthy until two years ago when he had a large carbuncle on the back of the neck. This was excised but the wound took some time to heal and left a large cicatrix. A year later he again sought advice complaining of weakness and pains round the lower part of the chest and in the back. He was taken into hospital and examined for kidney trouble, but after a short time as the urine gave negative findings he was discharged with a diagnosis of myalgia. A month later he first noted blood in his urine. The hæmaturia disappeared for two weeks, but came back in a more severe form with large clots of blood causing pain and difficulty in urination. He was admitted to hospital and a cystoscopic examination was attempted but on account of the profuse bleeding nothing could be seen. The bladder was opened suprapubically on the supposition that a tumour was present but only some dilated veins were found at the base of the bladder. These were cauterized. No further blood was noticed for some months when slight bleeding again occurred for a short period of time.

An *examination* of the patient revealed the following:—

A firm swelling in the posterior triangle of the neck on the left side adherent to the deep structures, but not adherent to the skin and not tender to the touch. No glands could be felt in the neck or axilla. There was nothing to note about the lungs or heart. The arteries were somewhat thickened. A small swelling could be felt on the ninth rib on the right side, and there was tenderness in this region and in the epigastrium. In the transpyloric plane about the middle line was a visible swelling which on palpation gave the impression of a mass about the size of a fifty cent piece. There was a scar above the pubis with some hernial protrusion.

An *x-ray examination* revealed some enlargement of the right kidney, and a destructive lesion of the ninth rib on the right side. The *urine* now contained some pus with irregular findings of albumen, but no blood.

Late in October the temperature began to rise and continued to swing with remissions of four to five degrees until the time of his death. Paraplegia developed with the usual urinary complications necessitating the use of a retention catheter. Bed sores occurred over the sacrum and these extended deeply so that a portion of the sacrum sloughed away. Death occurred on December 9th.

Autopsy.—Body that of an oldish man considerably emaciated. There were extensive bedsores over the sacral region. Two swellings were present on the ninth rib on the right side, one towards the anterior end and the other about the middle. The bone at these points was soft and friable. There was a small opening into the bladder just above the pubis. In the heart there were no changes beyond what would be expected in a man past middle life. There were a few small patches of atheroma in the aorta. The lungs were congested in their posterior parts and showed early hypostatic pneumonia. Spleen and liver were congested. The left kidney was slightly enlarged but retained its shape. It measured 4 x 2½ inches. The lower two-thirds of the organ was replaced by a growth of a nodular character and mottled appearance due to yellow areas alternating with dark red areas of hæmorrhage. The growth did not extend appreciably beyond the limits of the normal organ. In other words it appeared to have increased in size largely by replacing the kidney tissue. It had however ruptured into the pelvis of the kidney. The right kidney appeared enlarged and congested. The bladder was small and its wall thickened. A small pouch existed behind the prostate which was slightly enlarged, and there were some dilated and apparently thrombosed veins about the trigone. The brain showed nothing of note. There were no tumour deposits in the bodies of the vertebræ. In the upper part of the dorsal region the spines of the vertebræ were infiltrated with a growth which projected inwards pressing upon the cord. In the lower lumbar and sacral region of the

cord there was an acute purulent meningitis due to a spread of infection from the bedsore over the sacrum. There was a large gland on the left side of the neck and another in the mediastinum close to the trachea showing deposit of growth with the same gross characters as the kidney tumour. Both suprarenal glands were normal.

Thus we have a tumour with the character of a hypernephroma in the lower portion of the left kidney, which produced secondary deposits in the glands of neck and mediastinum and in the ribs and spinal column. The cord was pressed upon by the growth in the spine producing a pressure myelitis. Bedsores occurred from which infection entered the spinal canal and caused a meningitis. Death was due to this and to a hypostatic pneumonia.

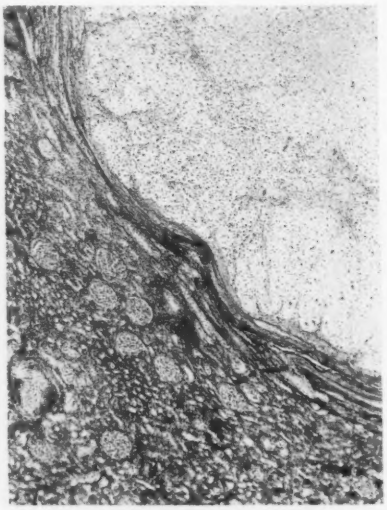

FIG. 1.—Growth surrounded by fibrous capsule pressing aside kidney tissue.

FIG. 2.—Low power view of tumour showing alveolar structure, characteristic columnar cells and large hæmorrhage.

Microscopic appearances.—The growth in the left kidney was composed of polygonal or columnar cells of a relatively large size with vacuolated or finely granular protoplasm. MacCallum draws attention to the resemblance of such cells to those of growing plant tissue. Many of the cells had more than one nucleus and not infrequently mitotic figures were to be seen. Occasionally large giant cells occurred (Fig. 4). Sections stained with Scharlach R brought out the fact that the material in the vacuoles of the cells was lipoid in nature consisting largely, as Wells has proved, of cholesterin esters and other similar bodies resembling the fatty material found in the normal adrenal cortex. The arrangement of the cells was roughly an alveolar one with fine strands of stroma dividing the cells into polygonal or cylindrical areas but the alveolar structure was somewhat masked by a filling in of the gland spaces by degenerated cells. In places a papilliferous arrangement of stroma and cells was to be observed. The acinous structure was better seen in frozen sections after the degenerated contents of the alveoli had been washed

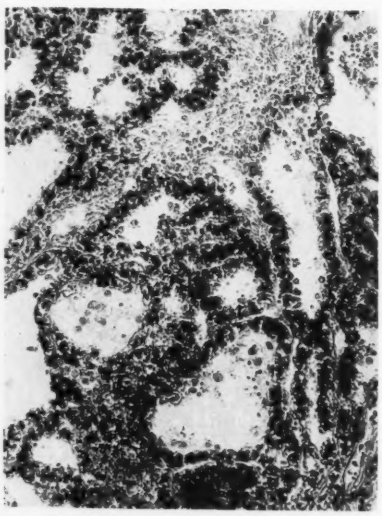

FIG. 3.—Low power view of tumour stained to show fat. Cells lining alveoli filled with fat globules.

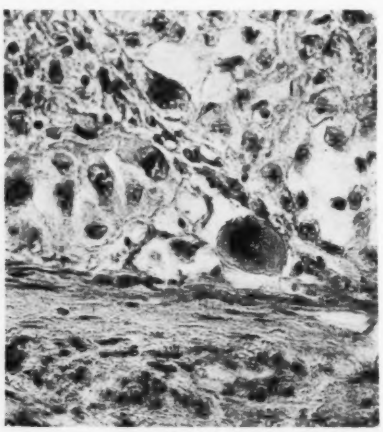

FIG. 4.—High power view of tumour showing some characteristic cells, one of them undergoing mitotic division.

out (Fig. 2). There was a marked tendency to necrosis on the part of the tumour cells. It was notable that the lipoid deposit was not more, but less marked, in the necrotic areas. In addition to the necrotic areas there was extensive hæmorrhage into gland spaces and stroma. The appearances of the kidney in the neighbourhood of the tumour were those of an interstitial nephritis with round cell infiltration and fibrosis. Pigment deposit was present within the stroma of the growth. Some of the dilated tumour spaces were filled with a homogeneous hyaline material to which the term colloid may be applied. Some of the larger thin walled vessels in close proximity to the tumour masses were invaded by growth, indicating the means by which the secondary deposits were spread. (Fig. 5).

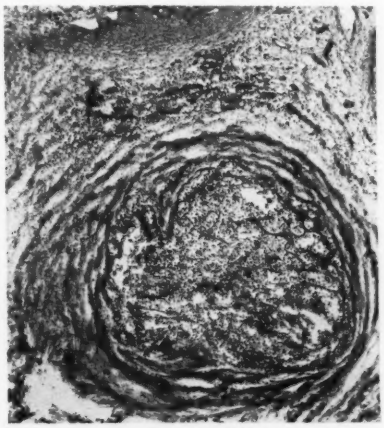

FIG. 5.—Small vein in kidney the lumen of which is occupied by a mass of growth.

The metastases in the glands (mediastinal) resembled in appearance the primary growth. Necrosis and hæmorrhage were an even more marked feature in them. The metastases in ribs and spine were also similar in character. Pronounced toxic change was present in the parenchymatous organs as indicated by fatty degeneration. This was notably the case in the heart muscle. The lung showed a pneumonia of a septic type. The prostate showed a combination of interstitial change with glandular hyperplasia. There were also present distended thin walled vessels filled with thrombi. The spinal cord above the point of pressure showed an ascending degeneration in the postero-internal tract. Below the point of pressure there was an acute meningitis of a suppurative type. A curious anomaly was the absence of evidence of degeneration in the lateral columns of the cord below the point of pressure.

Summarizing the case, we have a man of sixty developing in the last year of his life vague symptoms of weakness and pains in the chest and back. Hæmaturia comes on for a time but passes off again. On account of this the bladder is opened but little is found to account for the hæmorrhage. Some three months before his death a lump in the neck is noticed and a growth appears destroying one of the ribs. Paraplegia then develops followed by bedsores and urinary complications. A diagnosis of malignant growth was made with secondaries in glands and bones, and as bone metastases are not uncommon in prostatic carcinoma, in the absence of a more definite site, the prostate was selected. The most misleading feature of the case from the clinical standpoint was the failure of the left kidney, which was the seat of the malignant growth to enlarge appreciably, or to alter its shape. Had it done so a correct diagnosis might have been possible. Another misleading feature was the cessation of the hæmaturia. The right kidney was correctly noted as enlarged but this increase in size was no doubt compensatory due to destruction of the greater part of the left organ. Death was due partly to an acute meningitis from an extension of the bedsore infection through the sacrum, partly to hypostatic pneumonia.

The growth obviously comes into the category of the hypernephromas. This diagnosis is warranted partly by the position of what appears to be the primary growth in the left kidney; partly by the character of the growth itself notably the presence of lipoid material in large amount within the tumour cells. The hypernephroma is the most frequent type of kidney tumour. It receives its name from its supposed origin from adrenal tissue. It was first described by Grawitz by whose name the growth is sometimes known. It possesses distinctive characters by which it can be recognized even when situated in uncommon positions. These characters as regards gross appearances are the yellow colour of the growth due to the lipoid with which its cells are filled, and the occurrence of hæmorrhage due to the delicacy of the stroma, and to the thin walled blood vessels. Comparatively simple in some types and in the early stages the tumour if not removed tends to become malignant destroying the tissues in the neighbourhood and producing metastases most commonly in lung and bone marrow. Two views are held as regards the origin of this type of growth. From the time of Grawitz the idea that it arose from suprarenal cortex or from isolated masses of suprarenal tissue has been very generally held. Suprarenal rests which might give rise to such growths are common under the capsule of the kidney and occasionally in the liver and other organs. The cells of the growth bear a strong resemblance to those of the suprarenal cortex, and the occurrence of myelin and glycogen in the cells is in keeping with this

view. On the other hand these growths are much more common in the kidney than they are in the suprarenal and they are not specially frequent in the upper part of the organ, as one would expect were they of suprarenal origin. Moreover the cells are arranged in distinct acini quite unlike the columnar arrangement of the cells in the cortex of the suprarenal. These facts have suggested that possibly the growths might originate in the kidney tissue itself from tubular epithelial cells. In support of this view is the observation made by Shaw Dunn that some cysts and small adenomata found in the kidney in the later years of life may contain myelin. In view of these facts the tendency at present is to regard such tumours as most probably of kidney origin. The question is however one which requires further investigation. So far as the present case is concerned the primary growth had no connection at all with the superarenal which was healthy. It occurred in the lower pole of the kidney. Moreover its structure was definitely tubular as seen in the accompanying photographs.

Retrospect

HEPATIC CIRRHOSIS IN CHILDREN WITH SPECIAL REFERENCE TO THE BILIARY FORMS

By R. R. Struthers, M.D.

Montreal

Four cases of liver enlargement associated with jaundice and splenomegalia are reviewed by F. J. Poynton and W. G. Wyllie, (from the Hospital for Sick Children, Great Ormond Street), *Arch. Dis. of Childh.*, Feb. 1926, I. 1.

The first case was that of a girl of eight who showed jaundice, an enlarged hard liver, a palpable spleen and some enlargement of the superficial thoracic and abdominal veins, but no ascites. Van den Bergh's test was positive both biphasic and indirect, suggesting incomplete obstruction of the bile passages and some liver damage, and a normal fragility test. The child had a tuberculous infection, and a subcutaneous injection of tuberculin produced, with the general reaction, some enlargement of both liver and spleen. Seen some months late, the liver was still palpable, but not the spleen, and the jaundice had entirely disappeared.

The second and third cases, a brother and sister, had abnormally large abdomens at birth, enlarged livers and spleens when examined at seven and eight years respectively, and each gave a history of jaundice when suffering from acute infections such as tonsillitis. Skiagrams of each showed some delay of ossification of the carpus, indicative of infantilism. Chemical tests showed no definite signs of liver inefficiency, though as the authors point out, there must be a considerable degree of liver tissue destroyed before such tests become positive. In all three of these children the amount of splenic enlargement was a minor feature.

The fourth case was a girl of five years who developed acute catarrhal jaundice with two other members of her family, apparently recovered at the end of three weeks and then relapsed. The child showed jaundice, an enlarged liver and palpable spleen. Under observation the jaundice lessened, but during an acute febrile disease the liver and spleen greatly increased in size; later subsiding with the fever, with a yellow tinge to both conjunctivæ and skin, but without bile in the urine.

Following the presentation of these cases a brief description of the various forms of hepatic cirrhosis encountered in children is recorded. (1) Portal or multilobular cirrhosis, seen less frequently in children than the biliary type, and associated with an enlarged liver and symptoms similar to so-called alcoholic cirrhosis in the adult. Pathologically, the liver is usually enlarged rather than reduced in size, coarsely nodular, pale and mottled, and shows on section a multilobular distribution of the fibrosis. (2) Syphilitic cirrhosis; the liver is usually found to be enlarged, firm and smooth surfaced. The cirrhosis is brought about by a small-celled infiltration which spreads indiscriminately throughout the organ. The fibrous tissue formed is both intralobular and pericellular. (3) Cirrhosis asso-

ciated with progressive lenticular degeneration; here the cirrhosis is mainly multilobular, a coarsely nodular pale liver. (4) Icterus gravis neonatorum, a familial disease associated with intense jaundice commonly observed at birth and notable for the intensive staining of certain parts of the central nervous system, particularly the lenticular nucleus, an enlargement of liver which may be soft, and microscopic details suggestive of an early biliary cirrhosis. (5) Hepatic cirrhosis in splenic anæmia (Banti), a multilobular cirrhosis occurs late in the disease, the organ is small, pale and firm and histologically shows an early cirrhosis of the portal type. (6) Cirrhosis associated with "Red Atrophy," occasionally, with or without a previous history of hepatic disorder, a patient may suddenly and unaccountably develop jaundice, pyuria, enlargement of the liver, ascites, and die in a few weeks' time. The microscopic appearances correspond closely to what is known as sub-acute yellow atrophy in adults. (7) The biliary cirrhoses, which are more common in children than the portal type, (a) hypertrophic or Hanot's cirrhosis, which is rare, but has been described in children; (b) congenital, biliary cirrhosis, or obliteration of the extra-hepatic bile ducts, associated with early intense jaundice, pale stools and enlargement of the liver and spleen, and death during the first year; (c) obstructive biliary cirrhosis is a rare event in children, and then only in the presence of obstruction to the common bile duct.

The authors describe the pathology of these forms of cirrhosis and discuss the various theories which obtain regarding their etiology. "There would appear then to be many common features in the hypertrophic biliary, the congenital infantile and the chronic obstructive forms of biliary cirrhosis. The macroscopic changes are fairly similar and their microscopy essentially alike, for all the fibrosis is related primarily to the bile ducts and becomes both intra and extra-lobular in distribution. Jaundice, once it has appeared, is usually a permanent symptom in each type, and the degree of biliary stasis, as indicated by bile casts in the ducts and between the columns of liver cells and bile granules in the cells themselves is proportionately far greater than is found in the case of a portal cirrhosis. In the biliary cirrhoses infection or toxic irritation of the biliary reservoir appears to be essential to their production, and whether this inflammation is primary or consecutive to a congenital or mechanical obstruction is of secondary importance. In obstructive biliary cirrhosis the dilatation of the intra-hepatic ducts is best explained by the onset of the obstruction preceding the inflammatory reaction. The interesting speculation arises whether the congenital form may not later develop into a hypertrophic biliary cirrhosis"

There are certain remarkable features associated with cirrhosis of the liver in the young, namely the familial tendency, infantilism and the liability to hæmorrhage. Regarding the four cases reported in detail, the authors suggest that the first is likely a case of portal cirrhosis associated with tuberculosis, the second and third rare familial cases of portal cirrhosis because of the transitory nature of the jaundice, and the fourth probably of an infective nature, with some degree of biliary obstruction, rather than a true cirrhosis. They conclude that the pathogenesis of the congenital, familial form of cirrhosis rests obscure.

Work of the Committee of the National Research Council on the Atmosphere and Man.—At its meeting in New Haven on March 7, 1926, plans were made for further development of the data on daily mortality in New York City in relation to weather elements, for the period 1883 to 1888. The analysis which the committee has directed to be made during the ensuing summer may lead to important and definite conclusions in respect to the association between the several conditions of the atmosphere and human mortality. There is an ever-growing interest in the effect of atmospheric conditions on health, mortality and efficiency. The interest in problems of ventilation, lighting and in other effective control of indoor conditions was never so strong as it is at the present time. The committee hoped that it might be feasible to pool the interest of hygienists, physiologists, meteorologists and statisticians at the present time, and to present a research programme which would unify the many specific endeavours now under way. The public health workers, through the American Public Health Association, have also shown a revived interest in the subject.—*Science*, March 20, 1926.

Editorial

THE THERAPEUTIC USE OF OXYGEN

ATTENTION is called in an editorial in a late number of the *Journal of the American Medical Association* to the fact that the use of gaseous oxygen for therapeutic purposes has been falling into apparent disrepute. This falling into disuse and disrepute must be attributed to the general failure to obtain results from the common method of administering the gas through a funnel held in front of the patient's face.

Few physicians can have any doubt whatever that anoxæmia is a not infrequent condition in many diseases. It may occur after hæmorrhage and in anæmia, and is a demonstrable symptom in many pulmonary affections especially in pneumonia. There is accordingly a rational basis for its administration, but to be of therapeutic potency the oxygen should amount to at least forty per cent of the respired air. We are glad therefore to record that during the past few years great improvement has taken place in the method of its administration. Barach, in a review of the history of its therapeutic employment, states that the first effective administration of oxygen began in 1917 when the Haldane apparatus was first used in the treatment of acute pulmonary œdema arising from war gas poisoning. In 1921 Barach and Woodwell described a rebreathing apparatus for cases of pneumonia and cardiac insufficiency. Henderson in 1922 described an apparatus for resuscitation from gas poisoning. In both of these, it should be noted, the increased efficiency is due in part to stimulation of the respiratory centre arising from the higher percentage of carbon dioxide in the rebreathed air.

Since 1921 oxygen chambers have been made use of by Barkoff and Pulton in England, and by Stadie and Bingham in America. Very recently Barach reports results obtained in the Presbyterian Hospital, New York, from a series of tests of the oxygen content in the nasopharyngeal air obtained by these various methods. By the old tube and funnel method the maximum oxygen content of the air breathed was only twenty-two per cent, as contrasted with twenty-one per cent in ordinary air. This slight increase in the oxygen content renders this method useless in therapeutic work. With the use of the nasal catheter a variable content of between twenty-two and thirty-five per cent of oxygen was obtained, depending largely on the rate of administration of the oxygen from the tank. For the relief, however, of severe arterial anoxæmia, a higher and more steady concentration of oxygen than this method affords appears to be necessary. To secure this Barach has devised an apparatus to allow the patient to breathe a mixture with a definitely greater content of oxygen. His apparatus consists of a glass nosepiece connected with the oxygen tank and also with a bottle containing soda lime for the absorption of the carbon dioxide breathed out. The other nostril is left free for the breathing of ordinary air. In this way the patient breathes a mixture of pure oxygen and ordinary air. If it is wished to increase the proportion of oxygen, nosepieces are placed in both nostrils connecting by a common stem with the oxygen tank. In this way the content of oxygen in the air respired may be varied at will. It is convenient sometimes to use a rubber tube in one of the nostrils instead of glass as the patient can then move about more easily. A much more elaborate arrangement has also been perfected by Barach and Bingher. This is a portable oxygen tent which surrounds the patient and his bed. It has four windows and is ventilated by an electrically operated fan. The proportion of oxygen in this tent can be regulated with great precision, and there is no inconvenience to the patient from nosepieces. Observations on the arterial

blood confirm the effectiveness of these methods in securing an oxygen rich atmosphere susceptible of regulation to the degree of concentration desired.

Under these improved methods there appears to be a distinct sphere of usefulness for oxygen therapy. Patients gravely ill show definite clinical signs of improvement. After the inhalation of air with an oxygen content of from forty to sixty per cent they breathe more comfortably and cyanosis is definitely diminished. In many instances also there is a definite drop in the pulse rate and in the respiration rate and the brain becomes clearer. It is however not to be supposed that by the administration of oxygen the bacteriæmia will be directly removed. The grave prognosis remains. Barach frankly admits that the value of the treatment is supporting and not curative, but considers that in many cases it may enable life to be prolonged until such a time as the antigens can do their work and accomplish recovery.

IMPORTANCE OF SUNSHINE AND SKYSHINE

THE importance of sunshine for the welfare of plants has long been recognized, and fresh air and sunshine have for long formed the basis of innumerable prescriptions for those who seek to regain health or to retain it. Attention is drawn in the *Journal of the American Medical Association* to the excessive production of smoke owing to the greatly increased use of soft coal under present strike conditions, undoubtedly affecting human health and happiness in various ways. Dust, smoke and the moisture of the atmosphere in the shape of fog suffice to absorb a great portion of the shorter ultra-violet rays, the most valuable ones, and prevent them from reaching the surface of the earth. All should know that ordinary window glass also filters out all but the less potent of these rays, and permits the passage only of a denatured sunlight, which retains the semblance, but has lost the value of the beneficient radiance of the sun. According to Leonard Hill of the National Institute for Medical Research in Great Britain, daily measurements of ultra violet radiation, taken by voluntary observers in various parts of England show that the smoke pollution robs the big cities of from half to two thirds or even more of this solar influence. Even in country places the effect of the rays is small in winter owing to cloud and mist. Hence the recognized beneficial effects of a winter holiday in a land of undiluted sunshine. We are only beginning to realize some of the penalties that we are paying for our tolerance of the perennial smoke cloud that lies so heavily over all large cities. Hill has reminded us that the ultra violet rays may come from skyshine as well as from the direct sunshine; indeed the sky shine may become the greater source, particularly when the sun is low in the heavens. For invalids who cannot enjoy the transfer to sunshine climates during the less favourable winter season the prospect of artificial illumination will arise. To the efforts made in this direction in the City of Glasgow we called attention in our last issue. The suggestion of a field of usefulness for artificial irradiation suggests possible dangers. The indiscriminate exploitation of lamps needs to be faced, and the menace of quackery should not be allowed to overshadow the possibilities of great benefit. Conservative investigators in Wisconsin* have indicated, also, the beneficial results to be expected by dairymen through direct irradiation of cows, for it is stated that the milk obtained from cows irradiated has a definitely higher antirachitic potency. It would certainly appear ad-

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* Steenbeck, Hart, Hoppert and Black. The antirachitic property of milk and its increase by direct irradiation, and by irradiation of the animal, *Jour. Biol. Chem.*, Dec., 1925, lxvi, 441.

Hughes, Payne, Titus and Moore, The relation between the amounts of ultra violet light received by hens, and the amount of anti-rachitic vitamin in the eggs produced, *Jour. Biol. Chem.*, Dec., 1925, lxvi, 595.

visable that milk for rachitic infants should be obtained from cows out for many hours during the day in direct sunlight, or when this is not obtainable during the winter months exposed to artificial irradiation for some period of the twenty-four hours. It has also been stated that the anti-rachitic vitamin in eggs from hens who have been exposed to this ultra-violet irradiation is definitely increased. These contributions of science call attention to the importance of the short light rays and to the benefits obtainable from direct sunlight, both sunshine and skyshine, and when these are wanting obtainable also from artificial illumination by the quartz mercury lamp.

THE PROBLEM OF MEASLES

MEASLES remains the one outstanding communicable disease about which we have little definite and reliable knowledge, and for the cure and prevention of which the medical profession is as yet almost helpless. Known from the earliest times; surprisingly uniform in its manifestations, it is probably the most widespread and frequent of all specific infections.

Of recent years there has been concentrated on the disease a vast amount of research, and the prospects of a solution of its problem are becoming brighter. The production of the disease in monkeys by Anderson and Goldberger, and more recently by several others has enabled us to recognize the presence of an exciting organism in the blood and naso-pharyngeal secretions in early cases. Many observers have shown that the blood of human convalescents contains an antitoxin to this disease, which induces a temporary immunity in susceptible persons, and as a cure the plan of collecting human convalescent serum and using it has been extensively adopted and used with success in the prevention of institutional and ward epidemics.

Tunnicliff and Moody have described a diplococcus obtained from the blood of early cases which is said to have agglutinated with the blood of measles cases and to have formed opsonins.

Most recently Drs. M. S. Ferry and L. W. Fisher have reported in the *Journal of the American Medical Association* for March 27th 1926 the isolation of a small Gram-positive streptococcus from the blood of measles patients which is possibly identical with the diplococcus of Tunnicliff. Ferry and Fisher have named their organism *Streptococcus morbilli* and state that it occurs in pairs and chains. They also claim to have prepared a toxin from the cultures which produces a positive skin reaction in susceptible persons, and which may be neutralized by the convalescent serum or by an antitoxin prepared from horses. Although the number of experiments in their preliminary report is limited, the results seem very convincing, and excite hope of the early development of a successful prophylactic treatment. If their observations are confirmed we can look forward to the early control of the disease of children which causes the greatest mortality at the present time.

H. B. CUSHING

INVESTIGATIONS INTO THE ETIOLOGY OF ACCIDENTAL HÆMORRHAGE

IN a recent address before a meeting of the Edinburgh Obstetrical Society, Dr. Francis J. Browne read a paper detailing the results of an experimental investigation into the etiology of accidental hæmorrhage and placental infarction (*British Medical Journal*, April 17, 1926).

It has long been known that accident or injury was but rarely the cause of the premature separation of the normally situated placenta which results in hæmorrhage. This name "accidental hæmorrhage" which dates from the days of Rigby (1776) is admittedly unfortunate, and is only to be read in the sense that no anatomical reason appears to explain the reasons why separation and hæmorrhage should occur, and is employed in contrast to the term "inevitable hæmorrhage" associated with placenta prævia. Dr. Browne in his researches attempted to produce accidental hæmorrhage experimentally in rabbits by the introduction of toxins, and several interesting facts emerged from his observations. In the first place he found that nephritis, either chronic or acute, appeared as an important, if not an essential factor, in the production of hæmorrhage. Secondly, the toxins most successfully employed were organismal in nature, the coliform organisms being found the most potent. Browne found that the mere introduction of the organisms failed to produce accidental hæmorrhage unless a chronic or acute nephritis had previously been induced in the animal by the repeated injection of oxalates. In all of the animals so treated, injection of the organisms on or about the twentieth day of pregnancy, a period corresponding to the end of the sixth month in human gestation, was followed by accidental hæmorrhage, or by the abortion of dead fœtuses, and in some cases by the production of infarctions in the placenta and hæmorrhagic effusions into the muscular wall of the uterus. The research is not yet complete, but it is strikingly significant that almost the whole gamut of changes associated with accidental hæmorrhage in a woman should thus have been produced experimentally. From the results obtained in these experiments Dr. Browne puts forward the thesis that external accidental hæmorrhage as well as concealed hæmorrhage and placental infarction are a pathological unity with a common underlying cause. The absence occasionally of albuminura, Browne endeavours to explain by the fact that a considerable degree of kidney damage, as evidenced by a high blood urea reading, may exist without actual albuminuria. Dr. Browne is still continuing his investigations, and obstetricians will watch with interest the further development of this thesis.

THE OPTICAL CONVENTION AT SOUTH KENSINGTON.

THE Optical Convention at South Kensington, London, was opened last month by the Prime Minister, Mr. Baldwin, and presented many features of interest to physicians. Optical science is a necessity of civilization, said Mr. Baldwin in his address and instanced the essential part played by the microscope in the war against disease. The exhibition gave evidence of the great advances made in this industry by British research workers in their attempt to rival and surpass the work of their competitors on the continent. Papers were read in two of the sections all day long; a number of popular lectures were given, and there was an exhibition with historical, research, and commercial sections of which it seemed one could never come to the end. Sir Frank Dyson's presidential address was a recital of recent optical triumphs, not only in his own field of astronomy, but also in surveying and telephotography. A lecture greatly appreciated was that given by Professor Elliot Smith on the eye and its functions, in which he traced man's intellectual superiority to his sense of sight, pointing out how in the course of evolution the special characteristics of his vision had separated man from the lower creatures, with whom smell was the directive sense. The exhibition of microscopes for research and other special purposes was particularly interesting. The recent developments in the art of producing suitable glass for

optical purposes was summarized in some of the lectures.

As a source of illumination for microscopic work the quartz mercury vapor lamp exhibited is worth mention. This lamp provides a source of illumination of absolute steadiness and great intensity, and is under complete control. Unlike most mercury lamps it is not a vacuum lamp but works under atmospheric pressure and requires no mechanical device for starting the arc.

The exhibits of glass manufacture also show distinct advance. The opacity of various kinds of tinted glass to the different light and heat rays has been carefully investigated, and interesting diagrams were shown indicating the colour rays as checked or transmitted by the various tinted glasses. It is now possible to make sure that a glass is suitable and effective for the definite purpose desired. In addition to the "Crookes" glass for ordinary use a dark green glass was shown to protect the eyes of workmen from light of extreme intensity, such as produced by acetylene and electric welders, and also from ultra violet radiations. Another glass to which the name "Calorex" has been applied is a roofing glass which has the property of absorbing the maximum amount of heat consistent with the transmission of a definite amount of light. It will have value in hot climates, or in factories where it is desirable to keep goods at a low temperature, and yet to take advantage of natural daylight. Vitaglass was also shown. This new form of window glass is transparent to a large extent to ultra-violet rays. Another new form of glass is daylight glass, the result of a number of attempts made during the last twenty years to find a single filter which when used in combination with some artificial source of light, (in this case a half watt lamp), will give a spectroscopically correct light similar to daylight. At the convention a small group of papers dealt with opthalmic optics. One of these was a description of the difficulties in fitting glasses for persons whose faces are asymmetrical. The author of one paper said that everyone who had paid attention to the fitting of spectacles was aware of the slight displacement of the right eye in the majority of adults. This he explained by the evolution of binocular vision resulting in a directing and predominant eye which in man being right handed was on the side of that member which had to perform most of the guiding operations. The proportion of adult males in western countries who have asymmetrical features to an appreciable degree was put by the speaker at 80 per cent. In females the proportion was lower, and among people in Eastern countries, whose features are as a rule more impassive, asymmetry is much less frequent. The general rule is to find the right eye further from the nose than the left, the amount of difference being usually 2 or 3 mm. To fit a person with frames and lenses when he has irregular features and when as in most cases he is unaware of it is one of the worries of the optician.

One department in which much recent work has been done is pyrometry. Several examples of the optical pyrometer were on view, some based on the measurement of the brilliancy of the light from glowing material and others based on the colour. Instruments were shown by which stellar temperatures as high as 28,000°C, far exceeding the temperature of the sun, were indicated, and it is stated that the optical laws on which the pyrometer is founded are so accurate that the figures may be accepted with confidence.

The optical instruments used in aviation were of interest especially those in which the difficulties arising from the condensation of minute droplets of water upon cold glasses on sudden change of temperature, had been overcome. Every wearer of spectacles is familiar with the fact that glass when rather cold can be obscured by light moisture. The designers of aircraft optical instruments, however, have managed to construct optical instruments which cannot 'mist' over even when the temperature is reduced many degrees below freezing point.

PRECAUTIONS IN TONSILLECTOMY

THE growing frequency with which tonsillectomy is recommended by physicians at the present has attracted attention to many possible unpleasant sequelæ. Daland of Philadelphia in a paper appearing in the *Archives of Otolaryngology* (1925, 1, 131) has called attention to the possibility of bronchopneumonia with pulmonary abscess following the operation, and has given the details of several cases. Meyerson in the same journal emphasized the importance of careful previous examination of the patient to exclude all possible pulmonary complications before any operation is attempted. Another very important observation has recently been emphasized by Zingher in an article which appeared recently in the *American Journal of Diseases of Children* (1926, 31, 72). He makes the statement that in not a few cases severe diphtheria has developed in patients after the operation. Although these three factors, absence of immunity to diphtheria, the presence of diphtheria bacilli in the nose or throat, and the open surface induced by an operation like tonsillectomy, are not likely to be present in the same patient frequently, Zingher believes that when they are present diphtheria is certain to follow, and the disease is likely to prove unusually dangerous. To this must be added the difficulty of recognising the disease promptly in the sloughing post-operative membrane, so that much valuable time may be lost and the opportunity for the effective administration of antitoxin may slip by. Moreover the diphtheria bacillus if by any chance conveyed, may readily develop after an operation in a susceptible person when the wound has not yet completely healed, and the resistance of the mucous membrane is still below normal. These facts are also emphasized in a recent editorial in the *Journal of the American Medical Association* (April 17, 1926) in which it is stated that they are borne out by the records of an extensive clinical observation. Zingher strongly recommends in this editorial that nose and throat cultures for diphtheria bacilli be taken always as a routine, before such operations as tonsillectomy and adenoidectomy. In carriers, in whom it is proposed to operate for the removal of tonsils and adenoids, it is especially important to make certain that the patient either gives a negative Schick reaction, or if a positive Schick reaction is obtained, that he receive a prophylactic dose of diphtheria antitoxin. It would also be well that he should receive an antitoxin dose against scarlet fever. The normal local resistance of the mucous membrane may be impaired by any inflammatory process, as an influenzal cold, but is very seriously impaired by any such operation as tonsillectomy or adenoidectomy.

We may also call attention to a paper by Dr. T. J. Harris on the end results of tonsillectomy with special reference to legal responsibility. The seriousness of the operation in the opinion of Dr. Harris has recently been minimized to such an extent that the general surgeon, the pædiatrician specialist and the general practitioner all regard themselves as competent to perform it. Inevitably there have been many bad results, due at times to unavoidable causes, but in many instances to faulty surgery, and as a result accounts of damage suits have filled the air. Harris found it difficult to obtain accurate data on the subject of these damage suits by a questionnaire sent to leading laryngologists and to the secretaries of state medical societies. So far as information could be obtained there were 124 suits for malpractice after tonsillectomy threatened or instituted. Of these thirty-nine were not pressed by the plaintiff. Five suits were only threatened. In eleven the final outcome is not known. Of the remaining sixty-nine, twenty-four were settled privately, twelve were dismissed by the judge without trial, and twenty came to trial; in only five of these was a verdict secured for the plaintiff. In the light of all that has been said of malpractice it is noteworthy that records of only fifteen cases in the State of New York are obtainable. The one outstand-

ing principle in these suits recognized by the courts is illustrated in three of the four cases decided in favour of the plaintiff, namely, that there had been want of ordinary and reasonable care as the cause of the bad result.

TUBERCULOSIS IN NORTH AMERICAN INDIANS

THE Canadian Tuberculosis Association noted an increase in the death rate from tuberculosis in British Columbia. The Association set out to discover what age groups were showing increases. The provincial increase during the last four years was from seventy-four to ninety-five per 100,000. The age group study by districts did not suggest the causative factor. In consultation with the Provincial Board of Health it was found that the deaths among the Indians were being registered annually in an increasing percentage of the total deaths from tuberculosis in the Indian communities. Further, the influence this has upon British Columbia's tuberculosis death rate is evident when tabulated and charted.

British Columbia—Deaths from Tuberculosis, 1924

Race	*Population*	*Percentage of Total Population*	*Deaths from Tuberculosis 1924*	*Rate per 100,000*	*Percentage of Total Deaths from Tuberculosis*
North American Indians	24,316 †(24)	4.37	125	514.1	23.9%
Japanese	15,006 *(21)	2.59	24	159.9	11.7%
Chinese	23,533 *(21)	4.3	38	161.0	64.4%
Other Nationalities (Whites)	490,145 *(21)	89.5	339	69.1	
Total, British Columbia	553,000 .(24)	100%	526	95.1	100%

*1921 census; †1924 census (estimated). Data furnished by British Columbia Provincial Board of Health

It will be noted that the North American Indians form 4.3 per cent of the population, contribute 23.9 per cent of the annual tuberculosis deaths, and show a death rate of 514 per 100,000 population.

The Association has through their Committee on Tuberculosis among the Indians, successfully approached the Federal Department of Indian Affairs and obtained from them a grant, as well as their departmental co-operation and assistance to make possible an investigation of the disease among the Indians in British Columbia this year. Professor H. W. Hill of Vancouver University is chairman of the investigating committee, and will personally examine the epidemiological factors, the hygienic influences, employment, living conditions, etc., and will have to assist him Dr. Vrooman of Vancouver and Dr. Lamb, the provincial travelling diagnostician, to do the medical examinations, and Dr. Hill will personally supervise the assembling of the report. It is hoped the report will suggest some economical but more effective methods of combating the disease in these people. Dr. Hill is on the Indian Committee of the Canadian Tuberculosis Association, and is also on the British Columbia Advisory Council on tuberculosis, and the work is being carried on in this province through the co-operation of these two committees.

With further reference to Indians and tuberculosis, the Canadian Tuberculosis Association induced the National Research Council to assign practically one-third of their annual allotment for tuberculosis research, to be equally divided between the Saskatchewan Sanatorium at Fort Qu'Appelle and the Queen Alexandra Sanatorium at London, Ontario. The research at Saskatchewan is planned to be carried out very effectively among the Indians, and enjoys the helpful co-operation of the Federal Department of Indian Affairs.

R. E. Wodehouse

ON A STUDY IN VOCATIONAL GUIDANCE

UNDER this title a pamphlet has recently been issued by the Medical Research Council of Great Britain on the systematic study of methods applicable to the vocational guidance on the choice of their career of children leaving school. The object of the study was the determination of the best methods of testing children to bring out the facts which should guide parents or guardians in giving advice. The work was carried out by the Industrial Fatigue Research Board and the National Institute of Industrial Psychology, and consisted of an intensive study of a hundred children, boys and girls, who were to leave school in a year. The schedule of investigation was a comprehensive one. An enquiry was made into home conditions, family and personal history, and a questionnaire was sent out to parents regarding the behaviour of their children and for any hobbies and preferred interests they may have shown. Careful study was made of the school records and attainments. The Stanford scale of intelligence tests was employed in a special examination supplemented by a scale of performance tests, and Pintner's non-language group of tests. It was however in the estimation of the child's character that the greatest difficulty arose, and striking comparisions were made between the estimates made at one interview by observers to whom the children were strangers, and by teachers and others who knew the children well. The conclusion of the director supervising the examination was that the chief weakness of the scheme was an imperfect knowledge, not of the children but of the several occupations which might suit their special aptitudes. The booklet is of great interest, and should have a wide circulation and be read by both teachers and parents. It is a matter of great importance both to the country and to each individual that every one should find the occupation for which he is best fitted and in which he can take most pleasure.

A Study in Vocational Guidance, Medical Research Council. London: H. M. Stationery Office. 1926. (Pp. 106. Price 4s. net).

THE EMPLOYMENT OF KAOLIN IN INTESTINAL INFECTIONS

IN the past for many centuries Chinese physicians have used Kaolin in the treatment of intestinal disorders. In the latter part of the last century Strumpf of Wurzburg also recommended its employment in large doses for Asiatic Cholera, but in the west it has been chiefly employed in the manufacture of porcelain and by pharmacists in the preparation of dusting powder. In a recent paper *Jour. Infectious Dis. 1925* xxxiii, 434. Braadfladt describes its action on the intestinal flora in normal and pathological conditions; his investigations afford a scientific basis for its employment. Work in vitro, on animals and on man has demonstrated that it is not an antiseptic agent but that in fluid mediums, if kept in motion, kaolin will carry down with it large numbers of bacteria. More than this, it combines with the toxins and toxic products of cholera and of the typhoid dysentery group of organisms, and, apparently, with putrefactive and proteolytic bacteria. In this way, from 30 to 60 gm administered daily will change the intestinal flora of an adult from a predominantly proteolytic to an aciduric type. Recent workers in the field have successfully employed kaolin in Asiatic cholera, chronic ulcerative colitis, and acute enteritis. When taken in moderately full doses by the mouth, *B. welchii*, for example, disappears almost completely from the faeces. It does not upset digestion, and it tends to reduce intestinal fermentation as evidenced by flatulence. It has been used in the treatment of bacillary dysentery, chronic ulcerative colitis, and acute enteritis with success, and it might possibly be beneficial in food poisoning by members of the salmonella group if given early enough. Dr. Braadfladt's results, with their experimental basis, suggest that the use of kaolin in intestinal infections deserves an extended trial.

THE VALUE OF ORANGES IN THE DIET

AMONG foods recognized as possessing beneficial properties in excess of their nutritive qualities, oranges have been given a high standing as the result of recent investigations by a number of biologists. In a recent editorial the *Journal of the American Medical Association* quotes a recent paper by Chaney and Blunt[1] which appeared in the *Journal of Biological Chemistry*. These biologists state that in a group of children kept under observation the gains in weight were far greater than could be accounted for by the value of any food fuel derived from this citrous fruit. Calcium assimilation was decidedly benefitted, and the increased retention was greater than could have been obtained from the oranges themselves and greater than might have been expected from any stimulus to retention due to a larger calcium intake. The increase in phosphorus retention was even more marked than that of calcium; more than three times as much phosphorus was assimilated after orange juice was taken than before. Magnesium retention was also increased, although to a less marked extent than that of calcium and phosphorus. Nitrogen assimilation also appeared to be increased when orange juice was ingested, even although the nitrogen intake was not altered.

It is well known that oranges contain noteworthy amounts of the vitamines A, B and C. They are potentially alkaline so far as their effect on the acid base balance in the organism is concerned. How these several effects are produced is not yet definitely known, but Chaney and Blunt make the suggestion that the effect may be due either to the vitamines in the oranges promoting the economical use of elements already present, but not sufficiently used, or to some factor that stimulates a greater flow of hydrochloric acid in the stomach causing a greater acidity in the upper part of the small intestine, and thus a greater absorption of minerals. Whatever the ultimate explanation may be it is well to know that nutritive advantages may be secured in such a very pleasant way.

REFERENCE

(1) CHANEY, MARGARET S., AND BLUNT, KATHERINE, The effect of orange juice on the calcium, phosporus, magnesium and nitrogen retention and urinary organic acids of growing children, *Jour. Biol. Chem.*, Dec., 1925, lxvi, 829.

Editorial Comments

ON BIRTH CONTROL

The medical committee of the National Birth Rate Commission of Great Britain has sent out a questionnaire to gynæcologists throughout Great Britian, and is expecting to hear representatives both of medicine and of physiology on the medical aspects of conception control. The investigation represents an effort to obtain definite knowledge regarding any effects on the bodily and mental health of individuals arising from efforts at the restriction of families by whatever method attempted. Among the particular problems which it is proposed to investigate are the effect on health of sexual abstinence, partial or complete, in married life, and the effect of the use of various contraceptives on the subsequent health and fertility of the persons concerned. The members of the committee include many well known persons in the medical world; among others Professor Leonard Hill, Dr. A. E. Giles, gynæcologist, Dr. Mary Scharlieb, and Professor H. A. Marshall of Cambridge University.

We note that Mr. Thurtle, a Labour member in the House of Commons, asked leave to present a bill in the House to authorize local authorities to incur, when deemed expedient, the necessary expenditures involved in conveying knowledge of methods of birth control to married women who desired it. His purpose, he said, was to make known to poor women information, which would enable them to restrict their families. Year by year the falling off in the birth rate becomes more and more marked in the upper and middle classes, while in the poorer classes it was almost stationary.

In many districts in England where overcrowding was most rampant and poverty was most acute the birthrate was very high.

The question of having articles on medical matters appearing in the public press written by physicians who sign their names has been discussed by the Council of the British Medical Association and the New Health Society. The following is an abstract from the ruling adopted by the former Association at their last meeting, as a statement of their official policy: "From time to time there are discussed in the lay papers topics which have relation both to medical science and policy and to the health and welfare of the public, and it may be legitimate, or even advisable, that medical practitioners who can speak with authority on the question at issue should contribute to such discussions. But practitioners who take this action ought to make it a condition of publication that laudatory editorial comments or headlines relating to the contributor's professional status or experience shall not be permitted; that his address or photograph shall not be published, and that there shall be no unnecessary display of his medical qualifications and appointments. There is a special claim that practitioners of established position and authority shall observe these conditions, for their example must necessarily influence the action of their less recognized colleagues. Discussions in the lay press on *disputed points of pathology or treatment* should be avoided by practitioners; such issues find their appropriate opportunity in the professional societies and the medical journals." The New Health Society agrees with the British Medical Association in the desirability of prohibiting any contributions from the medical profession to the press which give advice or express opinions with regard to this or that method of treatment. It is impossible for an uninstructed public to estimate the real value of any such method. With regard, however, to the spreading of knowledge of the simple measures necessary for the preservation of personal health, the society considers the position to be very different. Such knowledge, it says, is now entirely agreed on by the medical profession, and if put into practice by the people at large the standard of health of the whole community would undergo an extraordinary rise, and knowledge of the laws of health would be spread far and wide.

We have received the following comment from a prominent genito-urinary surgeon in connection with the paper on the control of arsphenamine treatment by liver function tests, contributed to our May number by Drs. Dixon, Campbell and Hanna:

"It has long been realized that the various arsenical preparations, so frequently and intensively used in the treatment of lues, exerted a toxic effect on the liver and impaired its functions. The work of Drs. Dixon, Campbell and Hanna show clearly the importance of controlling the administration of arsenic, and they demonstrate that in the Van den Bergh test we have a simple and reliable method at our disposal to guide us in regulating its employment.

The future must see the treatment of treponemal infections controlled by this test, or some modification of it. The authors are to be congratulated on calling the attention of the profession to these extremely important facts."

We have received the first number of the "Annals of the Pickett-Thomson Research Laboratory", and offer our congratulations to the publishers for the unusually elaborate quality of work which they have produced. The volume is concerned largely with work on infectious diseases, small-pox, measles and scarlet fever, etc., together with some interesting observations of medical conditions in workmen engaged in breaking down shells at Dannes-Camiers, France.

There is an abundance of excellent illustrations and the book is a monument to the energy and scientific ardour of this research laboratory.

We would direct the attention of our readers particularly to the Alberta News Items in the present issue. Details are there given of the contents of an Act now under discussion in the Alberta Provincial Legislature, which is to "Provide a Board to deal with the Discipline of the Professions."

Such a title is pregnant with a grave significance for the medical profession in Canada, as will be apparent on looking over the main points

of the proposed bill. We gather that the Cabinet of the Local Legislature is to assume powers of a disciplinary nature, which are indeed reminiscent of those enjoyed by the body, who gave so sinister a complexion to the word inquisition. According to this bill, the Cabinet appoints its Board behind closed doors, and the decisions of this Board are final. The Provincial Cabinet (in secret session, again) may define professional conduct, the basis for tests of fitness of any professional man, and the basis under which any unqualified man may violate any act governing the profession. These are only a few instances of the powers to be arrogated to the Provincial Cabinet.

We shall watch with the deepest interest the developments attending such radical proposals, and hope that by the time the next session of the new legislature takes place there will be a tendency for more moderate counsels to prevail.

Correspondence

LETTER FROM DR. W. J. MACDONALD

To the Editor:

THE CANADIAN MEDICAL ASSOCIATION JOURNAL:

In a preliminary communication on "Extractives of Liver Possessing Blood Pressure Reducing Properties", (*The Canadian Medical Association Journal*, July, 1924, vol. xv, No. 7, p. 697). I have already outlined the steps which led me to investigate the action of liver extracts on cancer, and subsequently on hypertension. At a later date, before the Toronto Academy of Medicine on December 1, 1925, as well as before the Suffolk District Medical Society in Boston, Mass., on January 6, 1926, and before the Section on Medicine at the American Medical Association meeting at Dallas, Texas, on April 23, 1926, I made the statement that "To the staff of Western Ontario Medical School, and especially to Doctors James and Laughton, I wish to express my appreciation for the facilities afforded me in London. During the month of October, 1924, Dr. James and Dr. Laughton collaborated with me in a research on carcinoma. During this period I was informed by Dr. James of his research carried out during the earlier months of the year when he found that with certain extracts of the liver he could reduce to normal in a shorter time than usual, hypertension in the rabbit produced by epinephrin and other pressor substances.

In these papers I reviewed the previous literature on the blood pressure lowering effect exerted by various liver extracts on laboratory animals. My work with liver extract was primarily on cancer. It was at a later date while using extracts other than those supplied by James and Laughton, that I observed definite and moderate falls in blood pressure in patients, and this constitutes, I believe, the first instance in which such effects were observed and recorded on human cases as distinguished from those of peptone, protein split products, or the condition known as shock.

Following these early observations in which a fall in blood pressure was observed in a case of carcinoma, I used liver extracts of the same type in several non-cancerous patients suffering primarily from hypertension. During the past year, before several medical gatherings, I have endeavoured to make it clear that I make no claim to priority as to the effect of liver extracts on hypertension as studied on laboratory animals. If I am entitled to any priority in this work it is purely to the clinical application of already demonstrated laboratory procedures.

W. J. MACDONALD

June 3, 1926.

LETTER FROM DR. McKIBBEN AND PROF. BRUCE MACALLUM

The above statement by Dr. Macdonald affords an explanation for the misunderstanding which has arisen in connection with liver extracts in which Doctors James, Laughton and Macdonald have been interested. The University of Western Ontario now realizes that the misunderstanding has arisen largely because Dr. Macdonald did not keep in touch with the university during certain stages of his work, and on account of the fact that the press did not fully and accurately report the statements which Dr. Macdonald made concerning his work.

The University of Western Ontario wishes to withdraw any statements which may have been interpreted as directly or indirectly calling in

question Dr. Macdonald's honesty, and to disclaim any responsibility for certain unauthorized and regrettable statements which have appeared in the public press.

PAUL G. MCKIBBEN,
Dean. Faculty of Medicine.
A. BRUCE MACALLUM,
Professor of Biochemistry,
University Western Ontario.

June 3, 1926.

A LETTER FROM ITALY

The International Surgical Association (abstract from a private letter).

A part of our journey was through the land of Galvani, Galileo, Morgagni, and Harvey. Morgagni's demonstration theatre remains as he used it, and when Harvey was his pupil; in arrangement it would take a very well arranged one to beat it even to-day. Prof. Donati gave a surgical clinic to the members of the International Surgical Association that were in Padua at a delightful luncheon at his house. There were eleven present representing ten nations. Rather difficult at first, but the influence of his good wine was remarkable. We soon found ourselves talking to each other and enjoying a pleasant hour.

The meeting in Rome was attended by about 650 surgeons, representatives from twenty-three countries and was quite successful; such gatherings contribute to a better understanding and to a sympathetic appreciation of the strong and weak points in the medical art of countries widely separated geographically.

It was very unfortunate that Mussolini was injured after delivering his address of welcome to our Association. I shook hands with him five minutes before he was wounded. His address impressed me most favourably. He has a fine manly dignified presence, a pleasing voice and his matter was excellent. He is doing wonders for Italy, and indeed for the world in saving Italy from Bolshevism. Ten minutes after the shooting, Rome was a mass of flags and Fascists were marching and shouting their enthusiasm at his escape. He has all the better Italians behind him and is carrying into effect the best Italian ideals. Italy is progressing, the people appear contented, are well clad and well fed. There is practically no unemployment. G. E. A.

Men and Books

EARLY ACADIAN HOSPITALS

Some time ago, the *Glace Bay Gazette* published a description of what was claimed to be the first hospital in Nova Scotia, the King's Hospital at Louisburg, the plans of which, made in 1724, are preserved in the National Library at Paris. The building was quite a pretentious structure of masonry, two storeys in height and 265 feet in length, the central portion being surmounted by an artistic spire which reached a height of forty feet. There were four main wards, with accommodation for one hundred beds, besides several private wards. The hospital was administered by the Brothers of Charity. Ample provision was made for the observance of religious rites, as the hospital chapel served garrison and town.

A photographic copy of the drawings which lies before the writer, indicates that each long ward was lighted by only six small windows; and there is nothing to show that the wards were heated. Fireplaces are shown in adjoining rooms, and chimneys are shown in the roof over the wards, but nothing suggestive of a fireplace appears in the floor plan of the wards.

At the rear the ground was terraced to form two courts, of which the lower was used as a garden and recreation grounds.

This hospital was evidently a part of a general scheme, prepared after the treaty of 1713, for the establishment of Louisburg as a great French fortress. Only meagre records are available, but it would seem that rather complete plans were made for the lay-out of the town and for the principal buildings as well as for the fortifications. Old maps of Louisburg show that the hospital was centrally located and that it was one of the largest buildings in the town.

It is not likely that work on the construction of the hospital was commenced before 1726,

and it is quite possible that the present year marks the bicentenary of its foundation. On this point, however, I have been unable to secure definite data.

Although of such ample proportions and of such substantial construction, this hospital had but a brief history, as it was destroyed in the general demolition which followed the final capture of Louisburg by the forces of Britain.

There is little pleasure in disturbing the convictions of others, but in the interest of accuracy it is necessary to dispute the claim made that the King's Hospital at Louisburg was the first hospital in Nova Scotia. This distinction undoubtedly belongs to Port Royal, (now Annapolis Royal).

In the section on early Canadian hospitals in Dock's History of Nursing there is the following:

> "The early French hospitals of which we find authentic record are, in chronological order, as follows:
>
> St. Jean de Dieu, founded in 1629, or shortly after, at Port Royal in Acadia (now Annapolis); no longer in existence....."

If this were an "authentic record", it would give this hospital priority among the hospitals of America save for one in Mexico. It is, however, extremely unlikely that it existed at so early a date as 1629 or even "shortly after". The number of French people residing in Port Royal and its *banlieue* at that time must have been very small. Many of those who had settled there moved away when Sir William Alexander's colony was established near by, 1621. Some of these returned after de Razilli's colony was moved from La Heve to Port Royal, by D'Aulnay, about 1634, and were joined by a few settlers from France, but the population grew slowly for some time. As late as 1671, Grandfontaine's census of Port Royal accounted only 361 souls. Fifteen years later, however, the number had increased to 622.

In his history of the County of Annapolis, Calnek states that "in 1702 the earthworks of the fort were completed, and a house for a hospital constructed, which was under the management of the two surgeons of the garrison". This is doubtless the hospital concerning which Rameau quotes (in "Une Colonie Feodale") from the Archives de la Marine:

> *"L'hôpital qui est établi â Port Royal a vingt-cinq pieds de long sur dix-huit de large, huit lits tres-mauvais, car il n'a rien été envoyé pour cet hôpital depuis cinq ans."*

This small hospital, with its eight very poor beds, and which had had no support for five years, must have been in existence for about a quarter of a century before the King's hospital was founded at Louisburg.

Students of Acadian history will remember the enmity that existed between Charles Amador de la Tour and D'Aulnay, the melancholy death of the first Madame la Tour, the tragic drowning of D'Aulnay, and the satisfactory ending of a feud in la Tour's marriage to D'Aulnay's widow. Among the descendants of this union were Charles de la Tour, who, in 1705, petitioned for the rentals of certain lands which had been granted him, and his niece Marie Mius de Poubomcoup. Against the wish of Bonaventure,* the acting-commandant, Marie married an officer of the garrison, Captain Francois du Pont du Vivier. Because Charles de la Tour had been a witness to the marriage, Bonaventure denied him the rentals asked for and ordered that they be paid to the King's Receiver, "declaring that the money ought to be given to the hospital".

There is an old plan of *Fort Royal a Lacadie*, dated 1703, which intrigues one into a fresh bit of conjecture. In this case one has only the key to the plan to assist him. An item in this key—*Logement de Gouverneur commencée*—suggests that this is perhaps the only building shown in the plan which was actually under construction, as it is reasonable to infer that the gouverneur would be the first official to be provided for. There are indicated a *Place pour de Lieutenant de Roy*, a *Place pour le logement du Major*, and "places" for various officials. It is of especial interest that the *Place pour le Chirurgien Major* is indicated as covering much more ground than is assigned to any other official. As even the chirurgien major of those days scarcely ranked as the most important of officials, it is unlikely that the building (? to be erected) was intended for his sole occupancy. May it not be that it was really for hospital

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* Bonaventure had been left in command by Brouillan when the latter left for a visit to France. Brouillan was perhaps the most unpopular of Acadia's governors. Among the many sins laid to his charge was that of "disturbing the wedding festivities of Pontif, the surgeon".

purposes, and designed to replace the little hospital which at that time was suffering sadly by reason of withheld support?

W. H. Hattie

CHESELDEN, ANATOMIST AND SURGEON*

By W. A. McIntosh, M.D.

Simcoe, Ontario

Cowper, the anatomist, was censured for making too free use of another's material in the publication of his text-book, under circumstances not entirely creditable. His apologists, however, are inclined to condone his shortcomings from the fact that he was the teacher of Cheselden.

During the period between 1916 and 1919, the writer was on occasional visitor to one of the best known old book shops near the British Museum, and as a result acquired a few old volumes. One of these was "The Anatomy of the Human Body, by W. Cheselden, Surgeon to His Majesty's Royal Hospital at Chelsea, Fellow of the Royal Society and Member of the Royal Academy of Surgeons at Paris, The VIIth Edition with Forty Copper Plates Engraved by G. Vandergucht." The book was published in London in 1756. This work was famous in its day and ran through thirteen editions. While it is probably not a rarity, the writer has seen only one other copy, which is in the library of the Academy of Medicine, Toronto. The first edition was published in 1732 and the thirteenth in 1792.

This volume reflects many sidelights upon the personality of its author, William Cheselden, who was one of the most remarkable surgeons of his day, and one who made real contributions to surgery. The last edition of the Anatomy was published forty years after the author's death.

Cheselden's book is in striking contrast with Cowper's Anatomy. Its first edition was published only five years after the publication of the second and last edition of Cowper, and it might therefore be considered as the direct successor to that work. Its immediate popularity may be accounted for in part from its small size, and the encouragement a student receives from the opening words of its preface, which are as follows:

William Cheselden

From the portrait by Richardson (who after the death of Kneller was the greatest portrait artist in England).

> 'The study of Anatomy, as it leads to the knowledge of nature and art of healing, needs not many tedious descriptions nor minute dissections; what is most worth knowing is soonest learned, and least the subject of disputes; while dividing and describing the parts more than the knowledge of their uses requires, perplexes the learner, and makes the science dry and difficult."

A text-book containing such a reassuring paragraph and small enough to be carried in the coat pocket is sure of a welcome reception from those most concerned. Cheselden's statement at that time would be received with the greater authority for the reason that he had reached such prominence, that in the same year in which his first edition was published, he became surgeon to the Queen.

The book is dedicated to Dr. Richard Mead, Physician to the King. It would appear that Cheselden and Mead were friends and there is no sign of the customary servility in the dedication. Their names are associated by Pope in "The First Epistle of the First Book of Horace" in the following lines:

> "Late as it is, I put myself to school,
> And feel some comfort not to be a fool.

* Read before the Harvey Club, London, Ont.

Weak though I am of limb and short of sight,
Far from a lynx and not a giant quite;
I'll do what Mead and Cheselden advise,
To keep these limbs and to preserve these eyes."

The eyes are mentioned in allusion to Cheselden's skill in operating for cataract.

The article on Cheselden by Dr. J. T. Payne in the "Dictionary of National Biography" states; He had a taste for literature and pretensions to critical judgment.....but his true bent was mechanical and it is stated on the authority of Faulkner's 'History of Fulham' that Cheselden drew the plans for Old Putney Bridge. He was also a keen patron of athletic sports, especially boxing."

Garrison's "History of Medicine" 1913 says of Cheselden: "He was patron of boxing and a good draughtsman, prepared the plans for Old Putney Bridge and the Surgeon's Hall in the Old Bailey, and assisted Vandergucht in sketching bones for his 'Osteographia' under the camera obscura."

Many references have been made to the versatility of Cheselden and his ability in the matter of drawing has been commented upon. Whether or not he made the plans for Old Putney Bridge cannot be definitely stated.

Picturesque London by Percy Fitzgerald published by Ward and Downey 1890 says:

> "The Old Putney wooden bridge with its piles and zig-zag bulwarks has been swept away. The fine new stone bridge is a great and much desired convenience but the sentimentalist will lament its crazy wooden predecessor rising so steeply and propped on angular wooden cages that were patched and repaired over and over again. This was dear to artists and etchers. The best portion was the gloomy old toll-house with its antique roof with a Nürnberg pattern, grim and shadowy."

and *Old and New London* by Edward Walford published by Cassel, Petter, Galpin and Co. states with reference to an earlier period:

> "In 1671 a Bill for the building of a bridge at this point of the Thames was brought into parliament but rejected. An act of Parliament, however, was ultimately passed mainly through the instrumentality of Sir Robert Walpole and the bridge was completed in 1729. Faulkner in his "History of Fulham" says "The plan of the bridge was drawn by Mr. Cheselden the surgeon of Chelsea Hospital,"who, he adds "in his profession acquired the greatest reputation, and by the skill displayed in this useful piece of architecture has shown the affinity that exists among the sciences."

Cheselden was a lover of the picturesque. His anatomical figures are posed. His "Anatomy" shows a kneeling skeleton and a picture of Hercules crushing Antæus to death, the latter picture being from the well-known sculptured piece in the Garden of Naples. The picture was no doubt made by drawing the outlines of the statue by means of the camera obscura and placing the muscles as though the integument only was removed. Upon this travesty of the original design the text makes this observation:

> "This table is done after the famous statue of Hercules and Antæus. The muscles here exhibited being all explained in other places, the figures are omitted to preserve the beauty of the plate."

Posed Skeleton

A man who would deliberately publish such figures was surely not a slave to convention nor would he be likely to confine his energies within narrow limits.

England at the time was pervaded by an architectural atmosphere. Inigo Jones had passed and left his impress, and Sir Christopher Wren who died at ninety when Cheselden was thirty-five was not only the greatest architect of his time, but was a skilled anatomist, and is credited with having first introduced

geometrical and mechanical speculations into anatomy. Wren also made the plates for Willis's Anatomy of the Brain.

HERCULES CRUSHING ANTÆUS

It is probable that Wren and Cheselden were acquaintances. There is an account of a meeting between Cheselden and Pope and Pope made sympathetic references to both. We may assume that Cheselden caught something from Wren.

Cheselden's activities in the direction of architecture, in the words of Allan Cunningham applied to Wren at an earlier period, "May be considered as indicating the casual sports of a discursive mind rather than the main bent of his genius."

Cheselden's taste for the bizarre in illustration is still noticeable in the attitudes of his figures in his "Osteographia" which is said to be his great work. It was published in 1733 and was considered a work of great merit, although violently attacked by John Douglas in a pamphlet entitled "Animadversions on a late pompous book called Osteographia". It was a folio volume and is not common. There is a reduced facsimile in the library of the Academy of Medicine, Toronto, called "Cheselden's Plates of the Human Bones reduced from the original copy" printed in London in 1816.

Two rather fantastic illustrations at the beginning of the "Anatomy" are thus described in the preface:

"The frontispiece represents the story of Hippocrates going to cure Democrites of madness, but finding him dissecting to discover the seat of the bile, he pronounced him the wisest man in Abdera."

"The print in the title-page represents a person drawing in a camera obscura, such a one as was used in this work."

The first use of a sensitized plate in photography was by Daguerre in France in 1820 more than a hundred years after Cheselden's first edition was published. Prior to this the nearest approach to a photograph was an image traced on the screen of the camera obscura by hand.

The biographical section of "Petit Larousse Illustre" has this item:

"Cheselden (Guillaume), savant chirurgien anglais praticien de premier ordre surtout dans l'operation de la cataracte."

"Encyclopedie Universelle, du XX Siècle. Cheselden (Guillaume) 1688-1752. Chirurgien et oculiste anglais; Membre de la Societé Royale de Londres (1712); chirurgien de l'hôpital Saint-Thomas; premier chirurgien de la reine Caroline et associé de l'Académie de chirurgie de Paris; Anatomie du corps humain, 1713. Traité de la taille au Laut apparcil, 1723; Osteographie, au Anatomie des os, 1733; etc."

While in England and in North America Cheselden's fame rests in the main upon his work in connection with stone in the bladder, it is evident that in the estimation of the French his work on cataract takes first place.

Cheselden was the first to form an artificial pupil by the performance of an iridectomy. His cataract operation was one of couching, not extraction. In couching, the crystalline lens was depressed into the vitreous and left to nature. With reference to this operation, Samuel Sharpe, who was a pupil of Cheselden, to whom his book was dedicated, says in his ninth edition, published in 1769, "Whether the whole cataract after its subsiding continues to lie at the bottom of the eye, or is quite wasted by being separated from its vessels, I have never had an opportunity of knowing positively by dissecting one that had been couched."

His general conclusion is that in some cases in which patients have been subjected to the

couching operation the cataract is gradually absorbed, in some cases it persists but in its altered position.

He further says:

"Since the publication of the sixth edition of this treatise a method of removing the cataract by opening the cornea and extracting the crystalline itself has been discovered. The experience of a little more time will evince whether it is preferable or not to the old operation."

Sharpe was a skilled operator in his day both as an oculist and as a general surgeon. He tells of one occasion in his practice where a lens dropped into the anterior chamber by accident and was there gradually dissolved. It does not seem to have occurred to him to bring the crystalline the rest of the way out.

On page 300 of Cheselden's seventh edition is "An account of observations made by a young gentleman who was born blind or lost his sight so early that he had no remembrance of ever having seen, and was couched between thirteen and fourteen years of age". This description has been considered a valuable contribution to psychology. It is too long to be repeated here.

Cheselden died in 1752 and cataract extraction does not appear to have been practised until after that date.

In English speaking countries it is upon his skill as a lithotomist that Cheselden's fame rests. He has received credit for the operation of lateral lithotomy. Perineal lithotomy is now seldom practised. The wagging of the pendulum in the search for the ideal lithotomy began hundreds of years ago. Cheseldon seems inclined to give credit to Frère Jacques for the operation of lateral lithotomy, although Brother James' claim is upon very uncertain grounds for Pierre Franco had done lateral lithotomy nearly a hundred years before the monk lithotomist.

The first lithotomy was by Celsus in the first century. His method came to be known as "cutting on the gripe" or "cutting with the lesser apparatus." Then came the method of the "greater apparatus" described in 1524 by Johannes Romanis.

In 1561 Pierre Franco published the account of the high operation which is now known as the supra-pubic. This method was for a time practised by Cheselden who afterwards discarded it for lateral lithotomy. It should not be forgotten that Cheselden operated without an anæsthetic and that in his day aseptic methods were unknown.

Medical Societies

IMAGINATION AS A METHOD OF TREATMENT

The Royal Society of Medicine

At the social evening of this society on March 1st an address was given by Dr. Gustave Monod of Paris and Vichy on "Imagination as a method of treatment." Sir St.Clair Thomson presided over a distinguished company which filled the Barnes Hall to overflowing. Dr. Monod first spoke of Cagliostro (Joseph Balsamo), the charlatan of the eighteenth century, who, after studying medicine and chemistry, wandered in many countries posing as a prophet and magician. Mass suggestion, as M. Coué had discovered for himself in our own day, was an important factor in healing by the imagination. Cagliostro's panacea was spirits of wine distilled on sulphate of antimony, and he had a famous mirror for conveying suggestions to his patients. His powerful personality, his consummate stage management, his weird polyglot verbiage, as incomprehensible to his auditors as to himself, constituted his technique, and it was not disputed that many of his cures were authentic. The second example was David Gruby, a regular physician of Paris in the nineteenth century. The technique of this famous practitioner was perfect simplicity; he drove his commonplace devices into the subconscious mind of his patient with unerring skill. His prescriptions were legendary in Paris, his Latin was all his own, his powders were chalk,

his mixtures were water, but his remedies to be efficacious had to be taken according to certain particular directions. The rheumatic patient was advised to eat three apples—one at 7 a.m. at the Arc de Triomphe, another at 7.20 in the Place de la Concorde, and a third in the Trocadero Gardens at 7.40. A nervous member of the Stock Exchange, with persistent migraine, was ordered to go to Versailles by the 12:30 coach to eat an orange, and return by the 2.24—in that way he missed his daily excitement on the Bourse. A lady suffering from intractable insomnia was ordered to take a spoonful of his famous water every half-hour during the night; the nurse had no difficulty with the first two or three doses, but when the fourth was presented the indignant lady insisted on being allowed to sleep! Gruby's therapy was based on using the patient's imagination to reinforce his own pre-eminent common sense, and his astonishing success earned him the odd title of the *derviche guérisseur*. The lecturer then referred to Emile Coué, who was formerly a chemist at Troyes, where his shop window had a battery of flagons, flanked by two splendid bowls, one red and the other blue, with his name in gilt letters above. Coué's method consisted in making straight a path for the propulsion of sufficiently potent concepts to seize the entire field of the subconscious mind. Auto-suggestion was brought about by the repetition of his celebrated sentence, "Every day in every way," etc., which had to be pronounced without a break twenty times in succession. In the French the sentence was entirely monosyllabic, and so ran quicker than in the English. Coué's cheery good nature was attractive. His self-deprecation disarmed criticism. He used a conversational tone and simple vocabulary. He stated his principles in few words, and proceeded to test the suggestibility of his patients, making a thrust at any point he wished. The sitting concluded with a short peroration, recited monotonously, a homily of optimistic philosophy, with a few hints on digestion. It was, Dr. Monod said, to a definite category of morbid minds—"mythomaniacs"—that Coué addressed himself. His immediate results appeared to be remarkable. The word "cure" came trippingly to the tongue. But cure might be imagined as easily as disease. In the case of a definite lesion such as a hernia Coué said that the subconscious saw to it that the tear in the peritoneum healed little by little, or, in the case of a fibroid, that the subconscious mind, having accepted the idea that the fibroid must disappear, the brain ordered the arteries which nourished it to contract, so that the fibroid starved. As to malignant tumours, he said only that his method "improved" them. The truth was that what he did was to relieve the patient by removing the anxiety with which the imagination over-loaded the lesion. Reduced to the simplest expression, the most implacable of diseases might be induced to create a minimum of reaction.

The lecturer discussed the possible harm of Couéism. Coué stated that he advocated only the good use of his method. Yes, but what about others? The method might act both ways. No physician, however, could afford to neglect any kind of successful treatment. He could and would make use of good suggestions. He could learn from Coué. It was right to appeal to the imagination, but to rely on auto-suggestion alone was to turn patients into puppets. Lord Dawson of Penn, in proposing a vote of thanks, said that beneath the amusing passages of Dr. Monod's address there was a serious warning which the medical profession should take to heart—namely, as to the danger of vanity and pretence. The mind and the imagination must enter into the fabric of disease, and likewise into treatment, and it was for medical men to see that the psychical side of their work was honest, delicate in its application, and incidental in its methods.

DISCUSSION OF THE PHYSIOLOGICAL FACTORS DETERMINING THE ACIDITY OF THE GASTRIC JUICE

Report of the April Meeting of the Halifax Branch, Medical Society of Nova Scotia

The speaker at the meeting on April 14th was Dr. Boris P. Babkin, Professor of Physiology at Dalhousie University. Dr. Babkin discussed very fully and attractively the physiological factors determining the acidity

of the gastric juice and the gastric contents, and urged the importance of an intelligent application of the results of physiological research to medical practice. The initial acidity of the gastric juice was given as 5 per cent HC1, that of the gastric content at 0.2 per cent HC1. Six factors were considered to have an influence upon the degree of acidity: (1) the action of the saliva and food masses; (2) the gastric mucus; (3) the regurgitation of duodenal juices into the stomach during normal digestion; (4) variations in the acidity of the gastric juice itself; (5) differences in the distribution of the chlorine between the hydrochloride acid and the chlorides of the gastric juice (Rosemann's theory); (6) the influence of the water and chloride content of the body on the gastric secretion. Taking these factors seriatim, Dr. Babkin explained first that saliva swallowed with food has a definite neutralizing power, similar to the buffer action of the blood, and that the proteins of the saliva have the property of binding the acid. The foodstuffs may also neutralize the acid of the gastric juice. The hydrogen-ion concentration of pure gastric juice is equal to P_H 1.1; that of the gastric content is much lower, being equal to P_H 2.5. With reference to the second factor, it was pointed out that the surface epithelium of the gastric mucous membrane secretes an alkaline mucus containing a typical mucin, which may neutralize the hydrochloric acid. As to the effect of the third factor, as soon as the acidity of the gastric juice reaches a concentration greater than 0.15 to 0.2 per cent of acid, the intestinal juices (pancreatic juice, bile, intestinal juice and Brunner's juice) regurgitate into the stomach and neutralize the acid. This phenomenon is a quite normal process, and has been observed in both animals and man. Bolton explains certain cases of hypo-acidity and hyper-acidity by hypo-tension or hypertension respectively of the pyloric sphincter, allowing of an abnormally great or abnormally small quantity of the intestinal juices being regurgitated into the stomach. In respect of the variations in the acidity of the gastric juice, recent histological researches have shown that the peptic glands contain not only peptic acid and oxyntic cells, but also special mucoid cells. There are evidences that the gastric glands under certain conditions may secrete a juice rich in pepsin, poor in hydrochloric acid and and with a large amount of mucus-like substance. While still in the lumen of the gland, the acidity of the gastric juice may not always be the same. As regards the fifth factor, under differing conditions the distribution of C1 between the hydrochloric acid and the chlorides of the gastric juice will differ. Usually the more chlorine is secreted as acid, the less is secreted in chlorides, and vice versa, and the acidity of the gastric juice varies accordingly. Finally, it is found that the water and chloride content of the body must be considered. In certain forms of nephritis, the elimination of chlorides is alone affected. In such cases there is usually compensatory elimination of chlorides in the gastric juice, but the hyper-acidity thus induced is not necessarily related to any abnormal condition in the gastric mucous membrane.

W. H. HATTIE

Error of Basing Serum Diagnosis of Syphilis on Kahn Reaction Alone—Sigmund S. Greenbaum, Philadelphia, expresses the opinion that the serum diagnosis of syphilis is best served by using both tests as a routine. In his experience, both tests agreed as far as positive or negative were concerned in from 96 to 97 per cent of the cases. It is frequently observed that the two reactions vary in the degree of positiveness, but it is impossible to compare them accurately on this basis, because they vary so greatly in technicque and the immunologic principles involved. Nor is this a matter of much clinical importance; and it is of infinitely less importance than the question of a true and specific positive or negative reaction regardless of the degree of positiveness. — *Journal American Medical Association*, April 24, 1926.

Professor W. Lash Miller, of the University of Toronto, lectured on April 13 in the school of chemistry at the University of Minnesota. His subject was "The 'Outsider' in Scientific Research."

Abstracts from Current Literature

MEDICINE

Malarial Treatment of General Paralysis of the Insane. Yorke, W., *The Lancet*, February 27, 1926.

Treatment of this disease has always been along two lines: (1) specific therapy, injections of salvarsan and other preparations, the latest and most successful being tryparsamide. (2) Non-specific therapy, using febrile disturbances which for some reason have a curative effect. The injecting of patients with simple tertian malaria has now been carried out in a large number of cases and the encouraging results are reported and discussed by the author.

The technique consists in injecting 1 or 2 c.c. of a malarial patient's blood *intravenously*, or else allowing infective mosquitos to bite the patient suffering from general paralysis. After the incubation period is passed eight to twelve malarial attacks are allowed before the massive doses of quinine are administered to eliminate the infection. Naturally the point at which to begin quinine treatment may be difficult to decide. As regards choice of cases, aortitis or disease of the circulatory system is only a contra-indication if very advanced.

A table is given of 400 cases treated in this way at Vienna previous to 1923, the results in which are very encouraging indeed, one-third being restored to health and sanity and more being much improved. In England five asylums have used the method and report encouraging results; their percentage of "cures" is lower perhaps because most of their cases are of the advanced type. Twenty-three per cent were discharged from these institutions—a very definite gain.

The author admits that it is impossible to guarantee a certain result but considers the respectable percentage of real cures a justification.

Turning to the pathological side: the pathological reactions of the blood serum and spinal serum and spinal fluid unquestionably disappear. The condition of the brain is described in several series of post mortems, performed on patients who died during or after malarial treatment. In general, the report shows that practically all signs of syphilitic change disappeared. There is at first an exacerbation of the inflammatory reactions, a tissue warfare against the virus, followed by an almost complete retrogression.

Professor Yorke then shows that this work confirms much of our knowledge and ends with a warning against a too free or prolonged use of quinine, which can become a detriment rather than an aid to health. P. M. MACDONNELL

Right Iliac Fossa Pain. Carson, H. W., *The Lancet*, February 12, 1926.

Mr. Carson takes up the question of pain in this region not caused by the appendix and not relieved by its removal. While admitting that in "chronic" cases a clear diagnosis is not always easy, he deplores the very great number of unnecessary appendectomies. He thinks it possible that inside strain in young girls and middle-aged men who take up athletics energetically, can cause a real right iliac fossa pain because of a strained oblique muscle. Another often ignored possibility is a stone in the right ureter, or some urinary tract condition without temperature elevation or other signs of acute inflammation.

Tuberculous mesenteric glands and tumours of the colon, either ascending or decending, are mentioned as worthy of consideration, and the author then draws our attention to a more "indefinite" group. These are usually women under forty years, complaining of general depression, constipation, and flatulence; examination usually shows them to be underweight, flabby, inclined to carry themselves badly and to have a very poor sacral curve of the spine. X-ray examination shows a general visceroptosis, and measures such as nephropexy, and severing of the membranes which often constrict the cæcum or colon, do not bring relief any more than removal of the appendix. The treatment is still a problem.

Coming to chronic appendicitis itself, physicians are reminded that this condition most frequently causes a dyspepsia with epigastric pain and nausea; also that if an operation is performed the whole abdomen cavity should be examined. P. M. MACDONNELL

Some Clinical Aspects of Simple Goitre. Berry, Sir James, *The Lancet*, February 6, 1926.

The author first of all considers the varieties of goitre aside from malignancy, and acute inflammation. He finds two groups. First, those with increase of cellular elements plus diminution of colloid—the exophthalmic type. Second, simple or endemic goitre, in reality a degeneration rather than a hypertrophy: atrophy of cellular elements plus distension with colloid—this type, if the cause is not removed progresses to fibrosis of the tissue and even calcification.

The diagnosis between these two groups may be difficult in the early stages of both; also symptoms simulating exophthalmic goitre may supervene upon a simple goitre of long standing. These so-called "toxic goitres" are less risky for operation, and are not in the exophthalmic group. We are reminded that there are many other causes for tachycardia to be first considered.

Sir James refers to his extensive study of the endemic goitre areas, through Europe and elsewhere. In his opinion the "lack of iodine" theory of causation falls short of a satisfactory explanation. The actual location of goitre areas contradicts the idea that people near the sea are not subject to the disease and those at a distance very likely to suffer from it. For instance, goitre disappeared from a large school in India when a new water supply was installed, in which there was no iodine. His explanation is rather a geological one: in the case of what is known as young mountains there is active erosion, especially in the presence of glaciers, and the streams in that area contain inorganic mineral matter, which is probably calcareous. It is in this fact that he considers we have the explanation of endemic goitre. P. M. MACDONNELL

Water Metabolism. Andrews, E., *Arch. Int. Med., January*, 1926, xxxvii.

During the course of studies in dehydration fevers it was noted that the diuresis produced by injections of equivalent amounts of glucose varied within wide limits. In dogs injections of a 20 per cent solution of glucose were used. It was noted that the amount of water which could be extracted from the body bore a definite relation to the reaction of the tissues as measured by the plasmo-CO^2 combining power, Van Slyke method.

When the alkali reserve falls below 45 it is not possible to produce any dehydration by the injection of glucose. As the alkali reserve rose there was a nearly parallel rise in the water loss. It is deduced that the level of 45 of CO^2 combining power is the point at which all the water in the body is "combined" or fixed. That is the level at which its affinity for colloids in the tissues is greater than its affinity for glucose. At higher levels there is in addition a certain amount of water in a looser combination, a water reserve.

Enough alkali was given to raise the CO^2 combining power above 45; prompt diuresis ensued. In one experiment the sudden over-alkalinization of the tissues freed such a tremendous amount of fluid that there was no time to absorb it into the circulating mediums, and the dog died of œdema of the lungs. In cases where the CO^2 combining power is above 45 a much larger dose of alkali is easily tolerated. There is a large range (between 45 and 54 in dogs) in the tissue reactions which do not bring about changes in body weight.

The buffer action of the water is evident; it prevents human beings from swelling or shrinking with slight changes in environment. Numerous intradermal salt solution tests were made. It was clear that real tissue thirst did not begin until the CO^2 combining power level fell considerably under 45. LILLIAN A. CHASE

The Tension Theory of Pleuritic Pain. Bray, H. D., *Amer. Rev. of Tuber.*, January, 1926, xiii, No. 1.

Pain in pleurisy may be considered as due either to friction of the inflamed surfaces or to hyperalgesia of the intercostal muscles. Dr. Bray is satisfied with neither theory. He shows that friction sounds do not always correspond with the painful area; they may persist after pain has gone or they may not be accompanied by any pain at all, and also, pain may exist without any detectable friction. Again on this explanation pain should be equal during both phases of respiration, whereas it is usually absent on expiration, and it can be shown that the pain continues and is at its maximum if the breath is held, with of course no movement of the pleural surfaces at all. Fixation of the ribs by strapping really increases the excursion of the diaphragm on that side, so that really it is

only the direction of the pleural glide that it affects.

As regards hyperalgesia of the intercostal muscles, this hardly seems enough to account for the acute inspiratory pain, although there is no doubt that some such hyperalgesia does exist. It can be shown that the parietal pleura is sensitive, although the visceral layer is not.

The evidence in favour of this so-called "tension theory" may be summarized as follows.

(a) Acute pleurisy in the apical region is often unaccompanied by pain, or it is dull and aching in character. Pleurisy at the base, on the other hand, is usually painful and very acutely so, and yet there may be equal degrees of pleural inflammation in both areas. There is, however, a notably greater degree of tension at the base.

(b) The parietal pleura contains much elastic tissue and is firmly attached to the ribs, and the separation of the ribs on respiration is greatest at the base and axilla.

(c) The position of greatest comfort is bending of the body towards the affected side: this brings the ribs together and relieves the pleural tension. The converse position increases the pain.

(d) In diaphragmatic pleurisy the tendency is to keep the body straight and immobilize the diaphragm as much as possible.

e) The pain of pneumothorax cannot but be caused by tension since the air separates the pleural surfaces, and puts them on stretch.

(f) Effusion probably means immobilization of the ribs with relief of tension of the pleura. If bulging results pain will depend on the degree of inflammation of the pleura. H. E. MacDermot

Renal Injuries by Amino-acids. Newburgh, L. H., and Marsh, P. L., *Arch. Int. Med.*, Nov., 1925.

This article deals with the effects on the kidney of the administration of some of the amino-acids. Young healthy dogs were used. The amino-acids were administered intravenously and following this urines were examined daily or oftener for the presence of albumin, casts and red blood cells.

Some of the animals were killed at varying intervals after the administration of the amino-acids, and their kidneys immediately placed in fixing solution. The histologic evidence of abnormality was entirely satisfactory. Some animals whose urine became abnormal after injection were allowed to recover.

Alanin, leucin, glycin, phylalanin, caused no injury. Arginin and aspartic acid were mildly toxic. Lysin, histidin, tyrosin, tryptophan, and cystin were nephrotoxic.

The most important outcome of these studies is the demonstration that normal digestive products of protein are a source of renal injury, under the conditions of these experiments.

The authors remark that the concentration of nephrotoxic amino-acids following a high protein meal probably does not reach that caused by their injections, but it is in general true that repeated small doses of poison will eventually result in serious damage. Lillian A. Chase

SURGERY

Tuberculosis of the Cæcum. Larimore, J. W., and Fisher, Arthur O., *Ann. of Surg.*, April, 1926.

Primary tuberculosis of the intestine is comparatively rare, but as a secondary complication of pulmonary tuberculosis it is quite frequent. It is the most frequent metastatic complication of pulmonary tuberculosis, and is seen in from 60 to 90 per cent of cases at termination. The ileocæcal segment is the site of predilection.

There are three types of intestinal tuberculosis: the hyperplastic, the fibrous, and the ulcerative. If the disease is of the secondary type it is usually more acute and destructive and tends to rapidly involve many segments of the intestinal tract. The primary type on the other hand tends to remain localized and to be hyperplastic in character.

The clinical symptoms of the primary type are abdominal and are early those of a partial mechanical obstruction. Spasm and disturbed peristalsis may superimpose a functional incomplete ileus. In secondary tuberculosis there are the same symptoms, but there are also earlier manifestations characterized by dyspepsia, fullness, nausea, discomfort from gas, and anorexia, with occasional vomiting. Fairly characteristic is diffuse pain in the right lower quadrant with gas and cramps and fullness, occurring soon after meals. As late occurrences one gets tenderness on palpation, abdominal rigidity, and a palpable mass. Constipation gives place to regular action without medical means, which is sooner or later followed by diarrhœa.

In secondary intestinal tuberculosis, the x-ray shows alterations of the intestinal contour by filling defects and spasms with disturbances of motility. There is generally marked gastric motor delay with hypotonicity. The principal sign, therefore, of ileocæcal or cæcal colic tuberculosis is the progressively increasing intolerance of the cæcum to any content, which makes it non-retentive of barium. The irritability of the cæcum in the very early stage when this is not so marked can be demonstrated by fluoroscopic palpation, when it will be found that if the cæcum contains barium it immediately empties itself distally.

The authors report a number of cases where the diagnosis was made very early, and this was made possible by paying particular attention to the early irritability of the cæcum and ascending colon. A study of this series was very satisfactory in regard (1) to the very early determination of intestinal disease, (2) in the highly satisfactory tolerance of their pulmonary condition to the conditions and sequence of laparotomy, (3) in the uniform improvement of their gastro-intestinal function, and (4) in definitely changing the prognosis in one of the five cases.

The results of surgical therapy, which was resection of the cæcum, were most satisfactory.

R. V. B. SHIER

Local vs. General Anæsthesia in Upper Abdominal Operations. Mason, J. Tate, *Ann. of Surg.*, April, 1926.

The basis of this contribution was a study of 100 consecutive cases, of which 50 had ether and 50 local, or local and gas analgæsia. Local anæsthesia appears to possess a distinct advantage. The solution used was 0.5 per cent procain in 0.6 sodium chloride, to which was added nine drops of adrenaline solution to each 100 c.c. Anæsthesia was induced by local infiltration followed by anterior splanchnic block. In the local anæsthetic patient there are certain factors to be considered, such as individual sensibility to pain. Patients with fat abdominal walls are difficult to anæsthetize, and those with acute cholecystitis are hypersensitive. Apprehension plays an important part, and restlessness and nervousness are unfavourable for local anæsthesia. Rest, sleep, high glycogen reserve and a narcotic one hour before operation are essential. This was accomplished as follows: A light supper at 5 p.m. and later between 9 and 9.30 p.m. four crackers, 3 oz. honey, a glass of milk, to which was added a teaspoonful of lactose and 10 grs. veronal. In most cases this gave a good night's rest. One hour before the operation morphia gr. 1/6 and scopolamine gr. 1/150 was given hypodermically in magnesium sulphate solution, which increased its efficiency by 10 per cent.

It is a mistake to ask patients if they are being hurt, but they should be told if any slight discomfort is anticipated by the surgeon. In 40 cholecystectomies, 20 of which were done under local, the following factors were noted. Only 8 of the 20 local cases vomited as compared with 15 of the 20 ether cases. The postoperative stay in hospital was four days less and gas pains less frequent in the case of the local anæsthetic. The same holds for gastroenterostomies.

In the whole series operations under local averaged eight minutes longer. There was one case of severe, and four cases of mild shock in the series, and these all had ether anæsthesia.

R. V. B. SHIER

Strangulated Hernia from the Standpoint of the Viability of the Intestinal Contents. Beller, A. J., and Colp, R., *Arch. of Surg.*, April, 1926, 901.

The authors have studied a series of 278 cases of strangulated hernia, admitted to the Mount Sinai Hospital between the years 1914 and 1923. Nothing in the surgery of strangulated hernia is of greater importance than deciding on the viability of the hernial contents; it is a decision often demanding the most careful judgment. The contents of the sac may be obviously viable, or just as obviously gangrenous: it is the borderline cases which present most difficulty, those in which the serosa is dull, the hue of the intestine dark, peristalsis sluggish and pulsation in the vessels weak. It is probable that the ability of nature to restore the viability of the damaged intestine has been exaggerated, a conclusion which is supported by the proportion of cases which died after reduction instead of resection. There were forty-seven cases in which the intestine was thought to be viable and reduction was performed: of these 30 per cent subsequently died, the clinical picture in many of them

resembling intestinal obstruction, peritonitis or both. ..

From the experience of these cases it is evident that although, microscopically, the tissues were apparently viable, yet death was present, and this went on to progressive destruction of the bowel wall. The patients who succumbed were usually more than fifty, an age at which it is likely that some sclerosis of the vessels is present, and at which thrombosis is most apt to occur. The authors' point out that resection would probably have lowered the mortality, and although this operation admittedly has a high mortality this is because it is usually performed in the stage of frank intestinal gangrene with complete obstruction.

Resection need not be done as a routine. The questionable bowel may be left exposed in the wound for from six to eight hours, under proper precautions, and its fate can then be decided on with greater certainty. The choice of an anæsthetic is very important, and the authors strongly support the use of local rather than general anæsthesia.

Certain symptoms and signs are brought out. The pain is always sudden, sharp and localized, with nausea and vomiting in over 60 per cent. The pulse in the early hours is slow, the temperature normal. Loss of tenderness to pressure over the mass is invariably indicative of gangrene. Reduction by taxis, except in the very earliest stages is severely condemned.

The statistics of this series forcibly emphasize the importance of early operation. There was a mortality of about 6 per cent where the strangulation had been less than twelve hours. This gradually increased to 34 per cent where the obstruction had lasted up to forty-nine and seventy-two hours. After the third day the mortality dropped to 8 per cent but in such cases the obstruction was either incomplete, or else the contents were omental. It must be remembered, however, that gangrene especially in femoral hernia, may occur even within the first twelve hours. H. E. MacDermot

Spinal Anæsthesia; Demonstration of; Clinic of Dr. W. Wayne Babcock. Surgical clinics of North America (Philadelphia number). Feb., 1926. Vol. vi, p. 1.

Dr. Babcock avoids spinal anæsthesia when the operation entails "desperate risk". At his clinic 90 per cent of the more serious operations below the diaphragm are done under rachianalgesia. He considers it a far safer anæsthetic than gas and oxygen or ether. Dangers are due to defective technique. No other method is so satisfactory in acute abdominal infections, on account of the muscular relaxation and the absence of protoplasmic poison. The extent to which blood pressure falls varies directly with the number of anterior nerve roots affected by the anæsthetic. The fall may be counteracted by intravenous injections of fluid, especially serum or gum acacia solution or more powerfully by adrenalin solution. W. B. Howell

PÆDIATRICS

Erythema Infectiosum, A Clinical Report of Seventy-four Cases. Herrick, T. P., *Amer. Jour. of Dis. Child.*, April, 1926, xxxi, 486.

This disease was accurately described by Tschamer in 1886, and named erythema infectiosum by Stricker in 1899, and has since been described by many. The present article reports seventy-four cases of the disease seen in epidemic form. There are no prodromal symptoms; the first stage consists of a dusky flush on the cheeks and a few faint macular lesions around the neck and the base of the hair. In the second stage there is an extensive rash, more marked on the buttocks than on the trunk lasting about a week; finally there is a third stage in which the rash appears on the legs and forearms only. The rash on the face resembles erysipelas, the generalized rash is well marked and usually papular on the buttocks and the upper arms. On the arms the rash spreads peripherally, leaving clear areas in the centre, and tends to form a map-like appearance.

The average age of the cases seen was nine years and the average duration of the disease eleven days, the longest twenty-one days. The only other symptoms were slight burning or itching of the arms. The contagiousness was fairly high; no complications or sequalæ were noted, and none of the patients desquamated. The disease was so mild that the family physician was rarely called. Examination of the blood and urine showed no constant abnormalities. The disease is infectious, of unknown etiology and incubation period, and one attack

apparently confers immunity. No treatment is indicated or required.

The distinguishing features of the disease are its occurrence in epidemics, the lack of constitutional symptoms, the lack of any features distinctive of the other exanthems, the long course and characteristic progression of the rash; its evanescence in all stages, and the irregular outlines seen on the arms and legs.

R. R. STUTHERS

Recent Advances in the Diagnosis and Treatment of Purpura Hæmorrhagica. Williamson B, *Arch. of Dis. in Childhood,* February, 1926, i, 39.

This paper is a review of the literature on the surgical treatment of purpura hæmorrhagica by splenectomy, covering some fifty-eight recognized cases of the disease. Only two of these have been reported in the literature from observers in England, and the author suggests that cases are being overlooked in that country. Of the fifty-eight cases, fifty are classified as "well" at an average of two years post-operative. Six cases terminated fatally, of whom three were operated on during the first attack, and the fatal result in two others appears to be directly associated with the risks of operation and not with the disease itself. The disease is essentially one of early youth, the commonest age of onset being five years, rarely commencing after thirty years. Of the fifty-eight cases forty-four were females. In the majority of cases the condition appears to be chronic, usually an insidious onset, and remissions are a common feature, during which the patient may be completely free from all signs of a hæmorrhagic tendency, though usually one or more features persist. The existence of an acute form of the disease is a matter of uncertainty. Hæmorrhage may occur in any part of the body. The nose and the uterus are the sites of major hæmorrhages, the latter after the onset of menstruation. The minor hæmorrhages, petechiae and ecchymoses are present in all cases. Bleeding from the gums is very commonly found.

The diagnosis requires, petechiae and ecchymoses; external hæmorrhage from mucous membrane; that it be a primary disease; an absence of significant signs and symptoms other than those associated with hæmorrhage, with the resultant anæmia of a chlorotic type, and enlargement of the spleen; that it be a disease of early life, running a chronic course; a negative family history; and the following features in the blood, diminished platelets, a non-retractile clot, and a prolonged bleeding time and normal coagulation time.

The author advises against operation in "acute" cases owing to the difficulties of diagnosis and the high mortality, and suggests that operation be reserved for chronic cases suffering from disability from the disease. He outlines the differential diagnosis from hæmophilia, and abstracts the fifty-eight cases on which the report is based.

R. R. STRUTHERS

OBSTETRICS AND GYNÆCOLOGY

The Principles of the Technique of the Second Stage of Labour. DeLee, J. B., *Surg., Gyn. & Obst.,* May, 1926.

Since many babies die and many mothers are rendered invalids during the second stage of labour, it is essential that the accoucheur remain with the patient from the time the cervix is completely dilated until labour is completed.

The duty of the obstetrician during this time is:

(1) "To protect the mother from infection." Five thousand women die every year in the United States from puerperal infection, hence the most perfect aseptic technique is essential. Loss of blood, exhaustion, shock, and undue trauma should be guarded against. "Not what nature can endure, but what she can accomplish," should be the guide. Unnecessary trauma caused by the head pounding on the pelvic floor or against the inlet only invites infection.

(2) "To prevent undue injury." Unless the fascial supports of the cervix, bladder and rectum and the pelvic floor are preserved, prolapse will follow. Such damage can be reduced to a minimum by allowing the head to descend by natural forces to the pelvic floor, and then not urging undue bearing down, for a slow dilatation of the perineum causes less damage to both mother and child. The routine use of pituitrin to hasten the second stage, is one of the chief causes of injury. An episiotomy will often save the perineum, and relieve pressure on the baby's head—as will also the application

of low forceps, if carried out aseptically and skilfully.

(3) "To relieve excessive pain." An anæsthetic, judiciously given, lessons psychic shock and prevents too powerful expulsive efforts.

(4) "To preserve the life and health of the child." The fœtal heart should be auscultated every two to five minutes, and should it fall below 100, fœtal distress is indicated—and labour should be terminated in the quickest, yet most conservative way possible.

(5) "To prevent complications." Abruptio placentæ, eclampsia, ruptured uterus and cardiac collapse must all be watched for. Shock in the second stage is often the first indication that the patient is a cardiopath. In obstetrics more than anywhere else "Eternal vigilance is the price of success." ELEANOR PERCIVAL

The Radium Treatment of Carcinoma Uteri. Ward, G. G., and Farrar, Lilian K. P., *Amer. Jour. Obst. & Gyn.*, April, 1926.

Cancer is the most frequent independent cause of death in adult life—89.4 deaths from cancer occurring in every 100,000 in the United States. Of these 14.4 per cent occurred in the female genital organs, exclusive of the breast.

Cases of cervical carcinoma may be divided into four groups—classes one and two including those in which the disease is macroscopically limited to the cervix; class three, those in which the parametria are involved, and class four, those in which the whole pelvis is more or less solid. The importance of all clinics adopting a uniform classification is stressed, and the above, that of Schmidt, is recommended.

Hysterectomy can be considered only in class one, but even in these cases, it is felt that radium offers an equal chance of cure without the risk of an operation. Operation after radiation is not advised for fear of breaking down the connective tissue barriers and releasing possible active carcinoma cells, which have been imprisoned by the action of the radium.

The dosage given, should be such that normal cells are not damaged. On the other hand, it must be large enough to kill the cancer cells, and to restrict growth of outlying cells by blocking off the venous and lymphatic channels. The initial dose of 2400 - 3600 mg. hours is considered a test dose. If in six to eight weeks the tissues are still hyperæmic showing the presence of growth, a second treatment is given. Occasionally even a third may be necessary. In class one and two 52.9 per cent of cases and 23.6 per cent of all cases are living and well after five years—showing the marked advantage of early treatment.

In carcinoma of the fundus operation, or operation plus radiation, seem to give the best results. X-ray therapy is of doubtful value, unless one of the high voltage machines is used.

ELEANOR PERCIVAL

According to the English students of alcoholism it seems likely that while the nerve cells of the habitual drinker become tolerant to the presence of alcohol, other body cells are less able to accommodate themselves to it, with the result that they are liable to be injuriously affected, if the development of tolerance in the nervous system leads, as it naturally tends to lead, to the taking of larger doses of the drug. That is advanced as a reason why drinkers who have, as they would say, strong heads for liquor and who can consume a great deal of alcohol without becoming drunk, are likely to suffer in the long run from some of those bodily disorders characteristic of chronic alcoholism. On the other hand, people who are especially susceptible to the intoxicating action of alcohol are to a great extent protected from excess by that very fact. Just because they are so easily made drunk, they escape the more serious evils of chronic poisoning. Hence, the English writers believe, from the point of view of general health, the acquisition of tolerance really implies the removal of a protective mechanism—it allows the drinker to use the drug in doses which he could not have taken if his brain cells had retained their normal power of reacting to it.—*Jour. Am. Med. Ass.*, Feb. 13, 1926.

Association Notes

ANNUAL MEETING OF THE CANADIAN MEDICAL ASSOCIATION

VICTORIA, B.C., JUNE 21 - 22 - 23 - 24 - 25, 1926

Programme

MONDAY, JUNE 21, 1926

9.00 a.m. to 12.30 noon.
Meeting of Council.

12.30 noon.
Members of Council to be luncheon guests of Dr. Forrest Leeder at the Empress Hotel.

1.30 p.m. to 5.00 p.m.
Meeting of Council.

6.30 p.m.
Members of Council to be the guests of the Victoria Medical Society at dinner at the Empress Hotel.

TUESDAY, JUNE 22, 1926

9.00 a.m.
Meeting of Council.

10.30 a.m.
Official opening of technical exhibit, following which Council will reconvene until 12.30.

1.30 p.m. to 5.00 p.m.
Meeting of Council.

3.45 p.m.
Business meeting of the British Columbia Medical Association.

4.00 p.m.
Garden Party at Lady Barnard's.

6.15 p.m.
Annual Dinner of the British Columbia Medical Association and election of Officers.

Golf Tournament arranged by the Victoria Medical Society Golf Club—played at Victoria Golf and Country Club, Oak Bay. To play in early part of the day.

WEDNESDAY, JUNE 23, 1926

9.00 a.m.
General Registration.

10.00 a.m. to 11.00 a.m.
Official Opening.
Address by President, Dr. David Low.
Address by President-Elect, Dr. Forrest Leeder.
Official Greetings.
The Government of the Province of British Columbia: The Honourable The Premier Mr. John Oliver.
The City of Victoria: His Worship, Mayor Carl Pendray.

11.00 a.m. to 11.30 a.m.
Dr. Duncan Graham, Toronto. Pernicious Anæmia.

11.30 a.m. to 12.00 noon.
Dr. Charles Hunter, Winnipeg. Encephalitis lethargica.

12.00 to 12.30 noon.
Dr. Charles F. Martin, Montreal. High blood pressure from the standpoint of the general practitioner.

12.30 noon.
Official Photograph.

12.35 noon.
Luncheon.

1.15 p.m.
Inspection of Exhibits.

1.30 p.m. to 3.30 p.m.
Symposium on Goitre.

Surgical aspect—Dr. Gordon Fahrni, Winnipeg.
Medical aspect—Dr. A. H. Gordon, Montreal.
From the standpoint of prevention—Dr. W. D. Keith, Vancouver.
Radiological aspect—Dr. W. H. McGuffin, Calgary.

3.30 p.m. to 4.00 p.m.
Dr. J. C. Meakins, Montreal. Some phases of heart disease with special reference to the needs of the general practitioner.

4.00 p.m. to 4.30 p.m.
Dr. J. O. Thomson, Canton, China. Tumours, (illustrated by lantern slides).

4.30 p.m. to 5.00 p.m.
Dr. J. G. MacDougall, Halifax. Empyema.

5.00 p.m.
Inspection of Exhibits.

6.30 p.m.
Annual Dinner of the Canadian Medical Association at the Empress Hotel.

2.00 p.m.
Drive for Ladies—Victoria; environs—Marine Drive.

4.00 p.m.
Reception at the home of Mrs. Forrest Leeder, "Stoneyhurst," Rockland Avenue.

8.15 p.m.
Arion Club Concert.

9.45 p.m.
Visit to Astrophysical Observatory, Saanich Mountain.

THURSDAY, JUNE 24, 1926

9.00 a.m. to 9.30 a.m.
Dr. Edgar Allin, Edmonton. Surgical aspect of acute abdominal disease.

9.30 a.m. to 10.00 a.m.
Dr. J. S. MacEachern, Calgary. Prevention, diagnosis and treatment of post-operative peritonitis.

10.00 a.m. to 11.30 a.m.

Symposium on Duodenal Ulcer.

Radiological aspect—Dr. W. H. Dickson, Toronto.

Medical aspect—Dr. H. C. Moffitt, San Francisco.

Surgical aspect—Dr. F. N. G. Starr, Toronto.

11.30 a.m. to 12.00 noon.

Dr. H. W. Hill, Vancouver. Non-relation of malnutrition to the incidence of infectious diseases.

12.00 to 12.30 noon.

Dr. J. R. Davidson, Winnipeg. Nephrosis of thyroid origin.

ANNUAL MEETING OF CANADIAN MEDICAL PROTECTIVE ASSOCIATION.

12.30 noon.

Luncheon.

1.15 p.m.

Inspection of Exhibits.

1.30 p.m. to 2.00 p.m.

Dr. Willis Lemon, Rochester, Minn. Co-operative diagnosis and treatment between physician and consultant.

2.00 p.m. to 2.30 p.m.

Dr. V. E. Henderson, Toronto. The newer drugs their uses and abuses.

2.30 p.m. to 3.00 p.m.

Dr. L. G. Rowntree, Rochester, Minn Progress in our knowledge of kidney and liver diseases.

3.00 p.m. to 3.15 p.m.

Dr. Maude Abbott, Montreal. The Sir William Osler Memorial Volume (lantern slides).

3.00 p.m.

Mr. Butchart's Gardens.

4.15 p.m.

Guests of Governors of Brentwood College, reception and tea.

9.00 p.m.

Reception at Government House. Guests of the Rt. Hon. Randolph Bruce.

FRIDAY, JUNE 25, 1926

9.00 a.m. to 9.30 a.m.

Dr. F. G. Banting, Toronto. Medical research.

9.30 a.m. to 10.00 a.m.

Dr. J. G. Fitzgerald, Toronto. The etiology, diagnosis, prevention and treatment of scarlet fever.

10.00 a.m. to 10.30 a.m.

Dr. H. B. Cushing, Montreal. The effects of scarlet fever antitoxin.

10.30 a.m. to 11.00 a.m.

Dr. Alexander Gibson, Winnipeg. Acute arthritis.

11.00 a.m. to 11.30 a.m.

Dr. A. J. Grant, London, Ont. Chronic mastitis.

11.30 a.m. to 12.00 noon.

Dr. W. B. Hendry, Toronto. The toxæmias of pregnancy.

12.00 to 12.30 noon.

Dr. James Miller, Kingston. The present position of the cancer problem.

12.30 noon.

Luncheon.

1.15 p.m.

Inspection of Exhibits.

1.30 p.m. to 2.00 p.m.

Dr. L. J. Austin, Kingston. Injuries to the elbow in children.

2.00 p.m. to 2.30 p.m.

Dr. S. Gordon Chown, Winnipeg. Errors in diagnosis with reference to diseases of infants.

2.30 p.m. to 3.00 p.m.

Dr. J. A. Nutter, Montreal. Paralytic deformities of childhood.

3.00 p.m. to 3.30 p.m.

Dr. J. F. Barnhill, Indianapolis. (Subject to be announced).

3.30 p.m. to 4.00 p.m.

Dr. Ritchie-Rodger, Hull, England. The problem of the acute ear.

4.00 p.m. to 4.30 p.m.

Dr. W. R. Campbell, Toronto. A review of the causation, diagnosis and treatment of intestinal paresis.

4.30 p.m. to 5.00 p.m.

Dr. J. C. McMillan, Winnipeg. Lipiodol as an adjunct in x-ray diagnosis.

4.00 p.m.

Garden Party at Hatley Park, at the residence of Mrs. James Dunsmuir.

6.30 p.m.

Alumni Dinners, at Empress Hotel and Union Club.

6.30 p.m.

Ladies' Dinner, followed by bridge and mah jongg, at Crystal Garden.

TRANSPORTATION

Previous issues of the *Journal* carried an intimation that if one hundred or more members desired to travel to the Victoria meeting by special train, such accommodation could be secured.

As less than thirty have expressed their willingness to travel by special train and as in this number there is considerable diversity of opinion as to the route to be taken, all idea of a special train to Victoria is now abandoned. Many members who are going to the meeting, however, particularly from Eastern Canada, are urged to make their reservations soon, as indications point to heavy railway traffic about the time of our Convention.

Depending upon the distance to be travelled, summer tourist fares are cheaper than fare and one-half, such as may be secured by convention certificates, and in addition they allow stop over privileges until October. In purchasing your transportation the local agent will be able to afford you all information. All those travelling to the meeting are urged to obtain a standard certificate irrespective as to whether they are travelling on the summer tourist plan or a one way ticket. These certificates will be of no use to the summer tourist plan traveller but will assist in showing the travelling attendance and securing the half rate return fare we are planning for those who travel on that plan.

Any further information, which may be required by any member, will be cheerfully furnished by either the General Secretary of the Association or by the Local Secretary, Dr. M. W. Thomas, 1207 Douglas Avenue, Victoria.

ENTERTAINMENTS

GOLFERS—ATTENTION

The Victoria Medical Society Golf Club has arranged a Golf Tournament to be played at the Oak Bay links by courtesy of the Victoria Golf Club. This will be held on Tuesday, June 22, and the morning programme provides for medal play with full handicap and in the afternoon a contest against Bogey is planned.

The Scientific Programme of the Canadian Medical Association Meeting will commence on Wednesday, June 23rd, so that one may have a day's play by planning to arrive early morning on Tuesday by either Vancouver or Seattle or by ferry if motoring.

The British Columbia men play off early and attend the Annual Meeting of the British Columbia Medical Association at 3.45 p.m. on Tuesday.

Intending players are requested to communicate by letter or wire with Dr. D. M. Baillie, Belmont Block, Victoria, B.C.

Golf—Throughout the week—June 21st to 26th, the official button or badge will give you privileges at the Oak Bay Golf Course, the Colwood Golf and Country Club, the Uplands Golf Course, the Esquimault Course (nine holes) and the Cedar Hill Course (nine holes). Visiting ladies will enjoy the same privileges.

Tennis—Both ladies and gentlemen may play tennis by courtesy of the Victoria Lawn Tennis Club.

Bathing—The new Crystal Garden with its salt-water pool should not be overlooked. Out-door fresh water bathing may be found at Elk Lake.

Gardens—Victoria is noted for its wonderful gardens. The Ladies' Committee is arranging for visits to these gardens each morning, especially on June 24th and 25th.

Riding—Excellent horses for riding may be obtained which will carry those desirous of so doing, to the beauty spots in the environs of Victoria.

Beaches—Victoria is surrounded by beaches and salt water.

Motoring—Miles of paved roads radiate in all directions leading to the celebrated Malahat Drive, to the lakes and rivers, up the Island for trout fishing, and others to the Saanich Peninsula and Brentwood Bay where the salmon fishing is excellent.

The famous sunken gardens at the home of Mr. R. P. Butchart on Tod Inlet are a wonderful sight which must be seen to be appreciated.

Alumni Dinners—On the evening of Friday, June 25th, all Canadian graduates will dine as college units. McGill, Toronto, Queen's, Western, and Manitoba, all are represented in Victoria; we are planning for big parties.

Hotel Reservations—Write or wire Dr. Gordon C. Kenning at once. See Hotel lists in *Journal* of March or April.

Victoria, B.C., welcomes you and invites you to make this visit to the City and Vancouver Island the nucleus of a real vacation. A trip up Vancouver Island is worth planning, and if you are a sportsman you will find it a veritable wonderland of scenery, lakes and rivers.

PROPOSED AMENDMENTS TO THE CONSTITUTION AND BY-LAWS

Herewith is presented by the Committee on Constitution and By-Laws, suggested amendments to the Constitutions and By-Laws, to be dealt with by Council at the annual meeting in June, 1926.

CONSTITUTION

Article VI.—Affiliated Societies

"Any nationally organized Medical, Scientific or Sociological Body,„—change to read, "Any nationally or internationally organized Medical, etc."

Article VIII.—Officers

Change the last two words of the Article "*General Secretary*" to read "*Director General*".

Article IX.—The Council

Clause (b):—Eliminate the word "Provincial", which occurs in two places in this clause.

Clause (c):—"One delegate for each affiliated . . . .", change to read, "Two delegates for each affiliated . . . . ."

Clause (e):—"Chairmen of scientific sections . . . ." change to read, "Chairmen and Secretaries of scientific sections . . . ."

Article X.—Committees

(1) "The Executive Committee", change to read, "The Board of Directors".

(2) "The Committee in Charge of the Legislative Bureau", change to read, "The Committee on Legislation."

The remaining items under Article X, shall be rearranged as follows:

(3) The Committee on Medical Education.
(4) The Post-Graduate Committee.
(5) The Central Committee on Programme.
(6) The Committee on Constitution and By-Laws
(7) The Committee on Necrology.
(8) The Committee on Intra-Canadian Relations.
(9) The Committee on Publicity.
(10) The Committee on Public Health.
(11) The Committee on Ethics and Credentials.
(12) The Committee on Economics.
(13) The Committee on Pharmacy.

The last Clause in the Article which reads "by the Executive Committee", change to read, "by the Board of Directors".

Article XIII.—Amendments

Second sentence,—"Amendments may be suggested by the Executive Committee without notice of motion", change to read, "Amendments may be suggested by the Board of Directors or the Committee on Constitution and By-Laws, without notice of motion."

Note:—With reference to all the Articles of Constitution, wherever the words "Executive Committee" occur, they are changed to read Board of Directors"; and wherever the words "General Secretary" occur, they are changed to read "Director General".

BY-LAWS

Chapter I.—Membership

Section I.—Clause (a).—"He is a member in good standing in his Branch Association; except that, where no such Association is organized, he may be elected by Council after being nominated by two members in good standing in the Association;" change to read, "He is a member in good standing in his Provincial Association; except that, where no such branch is organized or where any branch has waived its limits of jurisdiction, he may be elected by Council with approval by the Committee on Ethics and Credentials."

Section 7.—"Any delinquent member having once failed to comply with the sections of this article shall not be restored to membership until all such dues, as may be determined by Council, have been paid";—change to read, "Any delinquent member having once failed to comply with the sections of this article shall not be restored to membership until all such arrears or other requirements as may be determined by Council have been met."

CHAPTER II.—GUESTS AND VISITORS

Section 2.—"Lay members of affiliated associations or societies may, upon invitation by the President, attend the Annual Meetings and participate in the discussions of a purely scientific nature;" change to read, "Lay members of affiliated societies may, upon invitation by the President, participate in the discussions of a purely scientific nature. Lay delegates may attend meetings of Council without voting power, and may, at the request of the Chairman, take part in any of the discussions."

Section 3.—"Medical students may be admitted as visitors to either the general meetings or to the meetings of any of the sections thereof, but shall not be allowed to take part in any of the proceedings. They shall be vouched for by a member of the Association to either the President or the General Secretary;" change to read. "Any medical student may be admitted as a visitor to the general meetings or meetings of any of the sections, but he shall not be allowed to take part in any of the proceedings unless he has been specially invited to present a paper by the Committee on Programme. He shall be vouched for by a member of the Association to either the President or Director General."

CHAPTER III.—ANNUAL MEETINGS

Section 2.—"When the Canadian Medical Association meets in any Province where there is a Branch Association, the meeting shall be held in conjunction with that Branch Association, and the local Association or Society shall have control of the arrangements under the direction of the Medical Association of the Province and the General Secretary of the C.M.A."

Change to read,—"When the Canadian Medical Association meets in any province where there is a Branch Association, the meeting may be held in conjunction with that Branch Association. The Branch Association or Local Society may be given control of the local arrangements for the meeting, under the direction of the Board of Directors of the Canadian Medical Association. The Association assumes full control of all financial obligations and the proceeds of the meeting.

Entertainment.—Such entertainment as the local hosts may desire to provide, is left entirely to their discretion, but shall not be a charge against the funds of the Association.

CHAPTER IV.—MEETINGS OF SECTIONS

Section 2.—"The Chairman and Secretary for each section shall be appointed by the Association or Society in charge of the annual meeting", change to read,—

"The Chairman and Secretary for each section shall be elected by each section during the annual meeting, at a time provided by the Council. They shall hold office until the conclusion of the next annual meeting."

CHAPTER V.—ELECTION OF OFFICERS

New Section 1.—"Any five members of the Association may hand to the Director General in writing, not later than the first day of the annual meeting, the name of a member whom they may wish to nominate for any office."

New Section 2.—"The Council shall, at its first session at the time of the annual meeting, appoint from among its members, a Nominating Committee, consisting of not less than five nor more than eleven members. They shall submit nominations for officers to the Association at a later meeting of Council, at which meeting other nominations may be received, and the Council shall then proceed to elect the officers by ballot."

NOTE:—It will be observed that the substance of old Section 2 has been made new section 1: and new section 2 replaces the substance of old section 1.

CHAPTER VI.—DUTIES OF OFFICERS

Section 3.—"The Vice-President . . . . .", change to read,—"The Vice-Presidents . . . . ."

Section 6.—"The General Secretary shall be also the Secretary of the Council and also of the Executive Committee of the Association." Change to read,—

"The Director General shall be also the Secretary of Council and of the Board of Directors of the Association."

CHAPTER VII.—THE COUNCIL

Section 1.—"The Council shall meet at least two days previous to the opening of the Annual Meeting of the Association; and thereafter while the Association is in session, the Council shall meet daily." Change to read,—

"The Council shall meet for at least the first two days of the annual meeting of the Association, and, thereafter, while the Association is in session, the Council shall meet daily."

New Section 2.—Change to read,—"During the interval between annual meetings, the Council shall meet at the call of the Board of Directors. For all such meetings of Council, due notice shall be sent to each member, stating the purpose of the meeting. The Board of Directors, if they desire, instead of calling such meetings of Council, may refer important questions to Council and obtain its decision by means of a mail ballot."

New Section 3.—The Council shall have supervision of all properties and of all financial affairs of the Association. It shall through its officers, conduct all business and correspondence, and shall keep a record of all meetings and the receipt and expenditure of all funds, and shall report upon same in the Journal after the annual meeting. In case of a vacancy in any office on account of death or otherwise, during the interval between meetings of the Association, it shall have the power to appoint successors. Before the close of each annual meeting, it shall elect the officers, select a place for the next annual meeting, and present a list of standing and special committees, appoint the Chairmen thereto, and arrange for the completion of the personnel.

New Section 4.—In order that the business of the Association may be facilitated during the interval between annual meetings, the Council shall appoint a committee of ten from its members, which shall be known as the Board of Directors. The President and President-Elect shall be ex-officio members of this Board.

New Section 5.—The Chairman of Council, at the request of five members of Council, may at any time, call a special meeting at which the Board of Directors may be annulled or changed, and for such other purposes as may be indicated in the notice of meeting.

NOTE:—The foregoing sections complete the By-Laws under CHAPTER VII, THE COUNCIL, and replace the original five sections in their entirety.

CHAPTER VIII.—COMMITTEES

Section 1.—Change to read,—"The Board of Directors shall meet before the close of the annual meeting at which it is elected and select its own Chairman. In all the business affairs of the Association it shall represent the Council and to it shall be delegated all the rights and powers of the Council. The Board of Directors shall report to Council at the annual meetings and at such times as the Chairman of Council may request.

This Board shall have charge of the publication of the official Journal of the Association and of all published proceedings, transactions, memoirs, essays, papers and programmes of the Association. At its first meeting, it shall appoint an Editor and a Managing Editor of the Association Journal; shall define their respective duties and fix their salaries; shall appropriate

a sum from the funds of the Association, etc., . . . transaction of business."

New Closing Paragraph:—"The Directors shall have the power, whenever occasion arises, to appoint a Court of Inquiry, consisting wholly or in part of the members of this Association. The duty of this Court shall be to hear and collect evidence,—(a) relating to any breach of ethics or professional conduct, or (b) to investigate as fully as possible accusations made in public, by spoken word, or by publication in letter or statements in the press which may be considered by the person complaining as slanderous or libellous. In making this appointment the Directors may,—(a) act on their own initiative but (b) must act whenever a request for investigation is forwarded to them by any branch association or by one of its component units or upon the written request of seven different members belonging to three separate units. The findings of this Court of Inquiry shall be returned to the Directors and if considered advisable by them, shall be referred to the Committee on Ethics and Credentials for their report. The report of the Court of Inquiry, the report of the Directors and the report of the Committee on Ethics and Credentials shall, as soon as possible, be referred to the Council for their decision. The decision of the two-thirds of the Council, present and voting at any regular or special meeting, or a majority on a mailed ballot shall determine the action to be taken by this Association. The cost of this Court of Inquiry shall, at the discretion of the Directors, on the result of the decision, be levied as (a) a charge against this Association, or (b) a charge against the parties invoking the appointment of the Court, or (c) the Directors shall make a division of the cost between such parties and this Association.

Section 2.—"To the Committee in charge of the Legislative Bureau", is changed to read, "To the Committee on Legislation."

Section 3.—Old Section 3 stands.

New Section 4.—To the Post-Graduate Committee shall be delegated by the Board of Directors, the responsibility of carrying out the post-graduate plans of the Association.

New Section 5.—It shall be the duty of the Committee on Programme to co-operate with the branch Association or the local Association or Society which is actively interested in the arrangements for the annual meeting. This Committee, with the assistance of the Chairman and Secretaries of each scientific section, shall have complete charge of the preparation of the scientific programme for the annual meeting.

New Section 6, is old Section 5.
New Section 7, is old Section 4.
New Section 8, is old Section 6.
New Section 9, is old Section 7.
New Section 10, is old Section 9.
New Section 11, is old Section 8.
New Section 12, is old Section 10.
New Section 13, is old Section 11.
New Section 14, is old Section 12.
New Section 15, is old Section 13.
New Section 16, is old Section 14, and is changed to read,—"Reports of all committees shall be printed and mailed to all members of Council at least two weeks before the annual meeting."

New Section 17, is old section 15, and the last two words, "Executive Committee" are changed to read "Board of Directors."

CHAPTER XI.—AMENDMENTS

"Amendments may be offered by any member of the Council and should be in the hands of the General Secretary three months before the Annual Meeting and published once in the Journal", change to read,—

"These By-Laws may be amended provided notice of motion is placed in the hands of the Director General three months before the annual meeting. Amendments may be suggested by the Board of Directors or the Committee on Constitution and By-Laws, without notice of motion. The proposed amendments shall be published once in the Journal before the Annual Meeting. No amendment shall become effective until sanctioned by a majority vote of the Council present and voting."

NOTE:—Throughout the By-Laws, wherever the words "Executive Committee" occur, they are changed to read "Board of Directors"; and wherever the words "General Secretary" occur, they are changed to read "Director General."

At a meeting of the Society of Public Analysts on February 3rd Dr. H. E. Cox, M.Sc., read a paper on the presence of arsenic in apples. Attention was drawn to the matter by the occurrence of two cases of illness attributed to the spraying of apples with lead arsenate. He stated that only five out of thirty-nine samples of Jonathan, King David, and Newtown apples were found to be free from arsenic, and eleven contained more than the statutory limit. The contamination is mainly, but not entirely, confined to the skin, arsenic having been found in the flesh of the fruit to the extent of about 3 per cent of that on the peel. It appears that rain does not remove all the arsenic. Washing under the tap, and even scrubbing, was found to leave appreciable amounts of the arsenic on the fruit, presumably owing to combination of the arsenic with the proteins of the skin. Reference has been made to the possibility of illness resulting from such contamination, and a circular has been issued by the Ministry of Health urging local authorities to examine samples of apples likely to be so affected, and to withdraw from sale any consignments that appear to be injurious. The new and important point emerges now that the arsenic penetrates the skin, and that thus a certain amount is retained by the fruit even after active scrubbing.—*Brit. Med. Jour.*, Feb. 20, 1926.

Obituaries

Dr. J. Douglas Bell who was drowned at Fort Francis was buried at Ingersoll on May 10th.

Dr. L. F. Cline one of the oldest practitioners of Kitchener died suddenly on April 22nd. Dr. Cline had practised for many years at Kitchener and Waterloo and for some time had been acting as jail physician for the county.

Dr. William Henry Groves who had practised for thirty-five years at Dixie, Ontario, died there on April 27th in his sixty-seventh year.

Dr. Wallace N. Moore, graduate of Toronto University in 1923 died at St. Michael's Hospital on April 18th.

Dr. Samuel McCallum, coroner of the Thornbury district, secretary of the Public Utilities Commission, member of the School Board, and Medical Officer of Health for Thornbury died there on May 1st. He was a graduate of the University of Toronto in 1899.

Dr. Horace Vivian Pearman, who for many years was a leading specialist in diseases of the eye and ear at Halifax, died at Wolfville on the 23rd of April. Dr. Pearman graduated at McGill in 1888, and established himself at Halifax a few years later. He was of a quiet, unassuming disposition, but his industry and thoroughness gained for him the confidence of his colleagues and the public alike, and he quickly built up a large practice. Several years ago his health became unsatisfactory and he was obliged to give up his work. He then retired to Wolfville, where he continued to reside until the end came. He was buried at Halifax.

W. H. HATTIE

Dr. W. E. Storey died in Kemptville in his fiftieth year. Born in Newbury, Middlesex County, he lived in Kemptville for a number of years and had served as member of the town council in addition to holding the office of reeve.

Dr. Albert D. Watson well known in literary circles of Toronto and one of the older physicians of his day died on May 3rd. A résumé of his medical and literary accomplishments will be shortly forthcoming.

Dr. James D. Wilson, physician of London jail and one of the best known medical men in Western Ontario, died in London on April 28th. Graduating from Trinity University in 1877, Dr. Wilson had been continually in practice for forty-eight years.

Dr. Percival T. H. Wythe a graduate of Queen's University in 1920, died in Hamilton on April 30th. Active in practice, in municipal affairs and athletics, Dr. Wythe had become well known in the city of Hamilton. He had served as alderman, and last year had occupied the position of chairman of the Board of Health; he was but twenty-nine years of age.

Medical News from the British Empire

GREAT BRITAIN

THE DECLINING BIRTH RATE

The annual figures for England and Wales of births, deaths and infantile deaths for the year 1925 have just been issued and are as follows:

	Birth Rate per 1,000 Total Population	Death Rate per 1,000 Population (Crude Rate)	Deaths Under 1 Year per 1,000 Births
England and Wales	18.3	12.2	75
105 county boroughs and large cities, including London	18.8	12.2	79
158 smaller cities (populations from 20,000 to 50,000 in 1921	18.3	11.2	74
London	18.0	11.7	67

The death rate for England and Wales relates to the whole population, but that for London and the groups of cities to the civil population only. The birth rate of England and Wales as a whole is the lowest recorded, except during the war years 1917 and 1918, while the death and infantile mortality rates are equal to those recorded in the previous year. The following table shows how steadily the birth rate continues to decline:

Birth Rate per 1,000 Population

1921	1922	1923	1924	1925
22.4	20.4	19.7	18.8	18.3

The figures for 1917 and 1918 were, respectively, 17.8 and 17.7. The death rate remains low, but is not the lowest recorded recently, as the following table shows:

	1921	1922	1923	1924	1925
Death rate per thousand population ..	12.1	12.8	11.6	12.2	12.2
Infant death rate per thousand births ..	82	74	70	75	75

A considerable effort is being made to bring about registration of both osteopaths and opticians in Great Britain, but so far this recognition by law has not yet been attained. In the case of both of these bodies Mr. Chamberlain, the Minister of Health, drew attention to the main difficulty which would always exist if osteopaths or opticians were to be allowed such recognition under the control of their own organizations, namely, the decision as to whether a given patient was suffering from a complaint which medically unqualified persons should be allowed to treat, or whether the case should be referred to a qualified medical man. He did not see how such a difficulty could be avoided by the legislation which was proposed. He was not impressed with the fact that such legislation did exist elsewhere; conditions in the Dominions were quite different to those in Great Britain.

The New Zealand government has purchased the former headquarters of the British Medical Association on the Strand, London, for about £200,000, which, the London *Times* states, is the highest price yet obtained

for property of that size on the Strand. The property is located where values have increased rapidly in the last two years.

There is a steady increase in the prevalence of smallpox, especially in the north and Midlands of England, although the type is exceedingly mild, a fact which has its disadvantage, as it tends to increase the indifference of the public in the matter. There is a noticeable connection in certain areas between the high percentage of exemptions from vaccination and the increase of vaccination. The figures of the increase for the years 1914-1925 are startling. In 1914 the number of cases was fifty-seven, and in the last three years up to 1925 the numbers were, 2,477, 3,757 and 5,300. There is a very marked decrease in the percentage of vaccinations to births; in 1905 this percentage was 47.8, whilst in 1925 it was 75.8.

News Items

NOVA SCOTIA

ANNUAL MEETING, MEDICAL SOCIETY OF NOVA SCOTIA

Plans for the annual meeting of the Medical Society of Nova Scotia, which is to be held at Halifax on the 7th and 8th of July, are now well advanced, and a very successful meeting is anticipated. An unusual amount of important business is to be dealt with. The address in medicine is to be given by Dr. Joseph Pratt, and the address in surgery by Dr. Frank Lahey, both of Boston. Dr. Lahey will also conduct a clinic. Among local contributors to the scientific programme will be Dr. A. F. Miller of the Nova Scotia Sanatorium, who will discuss the surgery of pulmonary tuberculosis. The entertainment of visitors is being carefully arranged for. On the afternoon of the first day, the visiting ladies will be motored along the shores of Bedford Basin and the Dartmouth chain of lakes, one of the most beautiful drives in the province, stopping for tea and dancing at the Brightwood Golf and Country Club, at Dartmouth. The Brightwood links are very attractive, with delightful views from every teeing ground. This entertainment will be in the hands of the Halifax branch of the Society. On the evening of the second day, the members of the Society will dine at the Ashburne Golf and Country Club where again every prospect pleases—and where man is not vile. The courtesies of both these clubs and also of the Gorsebrook Golf Club are extended to visiting members, so that the devotee of the ancient game may be assured of opportunity to demonstrate his prowess. Halifax is at its best in July, and those who attend the meeting may confidently expect a profitable and enjoyable experience.

Dr. J. G. MacDougall, of Halifax, has accepted an invitation to be one of a team of Canadian Medical Association extra-mural post-graduate lecturers to address the medical societies of several Saskatchewan centres in June.

The spring professional examinations of the Provincial Medical Board were finished on the 7th of May. There were fifteen candidates for the license of the Board, all of whom were successful.

Dr. Clyde S. Marshall, of Halifax, who received a Rockefeller Fellowship in psychiatry and neurology last year, has been granted an extension of his fellowship to cover a second period of twelve months.

The Osler Medical History Club of Halifax held its last meeting for the session on May 1st, when the host of the evening, Dr. A. G. Nicholls, presented a most interesting paper on early medicine in French Canada.

The annual meeting of the Provincial Medical Board was held on the seventh of May. All reports presented were of a very satisfactory nature. Officers were elected as follows: President, Dr. John G. MacDougall, Halifax; Registrar and Secretary-Treasurer, Dr. W. H. Hattie, Halifax; Executive Committee, Drs. J. J. Cameron, Antigonish, E. V. Hogan, Halifax, M. A. MacAulay, Halifax, J. A. Sponagle, Middleton; Discipline Committee, Drs. John Bell, New Glasgow, G. W. T. Farrish, Yarmouth, John J. Roy, Sydney.

At the annual convocation of Dalhousie University held on May 11th, the degree of medicine was conferred upon thirty-one of the thirty-two candidates for the diploma. The University medal in medicine was not awarded. A pleasing feature of the convocation was the recognition by the University of the splendid work of Dr. J. Clarence Webster, of Shediac, N.B., in the research of the history of the Maritime Provinces and in forwarding the interests of education. Dr. Webster was made LL.D. (Dal.)—a distinction which is really notable, as Dalhousie is always very conservative in the bestowal of this degree. He was further distinguished by being invited to deliver the principal address at convocation.

By an arrangement between St. Martha's Hospital and the University of St. Francis Xavier, a course leading to the degree of B.A.Sc. in Nursing will be commenced at the opening of the next session of the University. The first two years will be devoted to academic work at the University, the next two to general training at the hospital, and a fifth year to special training designed to meet the particular requirements of the career which the student has in view.

The Department of Public Health, Nova Scotia,

report on the vital statistics for December, 1925, shows that the infant mortality rate was 48.3 as compared with 81.2 in the corresponding month of 1924. Pneumonia was unusually prevalent, and accounted for sixty-four deaths; in December, 1924 the pneumonia deaths numbered forty-three. Tuberculosis, all forms, caused thirty-eight deaths; in December 1924, there were fifty-four deaths from tuberculosis. No deaths were caused by measles, scarlet fever or typhoid fever, and but two deaths were due to whooping cough in the month under report.

The annual meeting of the Halifax Branch of the Medical Society of Nova Scotia, which marked the close of the 1925-26 session, was held at the Carleton Hotel on the 28th of April. According to custom, the meeting took the form of a dinner, and there was no scientific programme. The retiring president, Dr. F. R. Little, was master of ceremonies. Very satisfactory reports were presented. The membership increased during the session from eighty-two to ninety-four. Dr. W. L. Muir, who has been the efficient secretary for some years, declined, to the regret of everyone, to offer for re-election. The officers for the new year are as follows: President, Dr. P. Weatherbe, Vice-Presidents, Drs. G. H. Murphy, S. R. Johnston and A. E. Doull; Secretary-Treasurer, Dr. V. O. Mader; other members of executive, Drs. J. V. Graham and W. L. Muir.

At the annual meeting of the Aberdeen Hospital, New Glasgow, held on the 14th of April, the reports showed that this excellent institution—the pioneer of local hospitals in Nova Scotia—had had a busy year. As usual the surgical service had been very active. The obstetrical service which was established a few years ago has proved to be popular. New Glasgow is in the heart of a mining and industrial area which has been very seriously affected by the business depression. In consequence of the unusual amount of unemployment, the revenues derived from various industries were much below those ordinarily received, and there was a deficit in the year's operations of approximately $11,000.00. The outlook in this respect is improving, however, and the management do not contemplate any reduction in the activities of the hospital.

The Nova Scotia Tuberculosis Commission was formed late in April at a meeting of representatives of various interested organizations. Mr. W. H. Dennis was elected acting chairman; Hon. Dr. B. A. LaBlanc, vice-chairman, and Dr. A. C. Jost, executive officer. The provincial government, the Medical Society of Nova Scotia, the Provincial Red Cross, the Canadian Tuberculosis Association, the Victorian Order of Nurses, the Women's Council, the Women's Institutes of Nova Scotia, the Nova Scotia Farmers' Association, the Provincial Department of Health, the Nova Scotia Sanatorium and the Provincial Department of Agriculture were represented at the meeting. Medical men present included Hon. Dr. B. A. LeBlanc (representing the provincial government), Drs. E. V. Hogan and K. A. MacKenzie (Medical Society of Nova Scotia), Dr. T. M. Sieniewicz (Canadian Tuberculosis Association), Dr. A. F. Miller, (Nova Scotia Sanatorium), Drs. A. C. Jost and H. A. Chisholm (Provincial Department of Health). The Commission is to consider and take appropriate action in report of any or all measures calculated to reduce the prevalence of tuberculosis in the province. The endeavour will be made to secure the funds necessary to meet the conditions upon which the Canadian Tuberculosis Association will give financial and other support to the scheme.

W. H. HATTIE

GENERAL

THE FEDERATION OF MEDICAL WOMEN OF CANADA

Organization of the Medical Women of Canada as a National Federation having affiliation with the Medical Women's International Association has been under consideration for some years past, and an informal preliminary meeting was held on the occasion of the meeting at Montreal of the Canadian Medical Association in June, 1923. As a result of action then taken, and of an urgent request from the British Federation of Medical Women for Canadian representation at the meeting of the Medical Women's International Association which was being held in London in the summer of 1924, an organizing meeting was called by announcement in the newspapers of the various provinces of Canada, on June 18, 1924, at Ottawa during the meeting of the Canadian Medical Association there. At this meeting a provisional constitution was drafted which has since received the approval of all the charter members, and officers were elected; Dr. Rosamond Leacock of Calgary who was then in London, was authorized by cable to represent the new Canadian Federation at the Medical Women's International meeting. The first annual meeting which was scheduled to meet at Winnipeg last year was unavoidably postponed, and it will take place at Victoria, B.C., during the meeting of the Canadian Medical Association. A luncheon has also been arranged after consultation with the Secretary of the Association, for Thursday, June 24th, at the Empress Hotel at 12.30 p.m.

The objects and policy of the Federation as set forth in the Constitution are as follows: "To promote the welfare and interests of Canada and of the medical profession and to co-operate with the British Medical Women's Federation and with similar federations in other countries having like objects and policy."

The officers are a President, Secretary, Treasurer, and eight Vice-Presidents representing the various provinces who with three others elected from the members together constitute an Executive Council. Any woman who is a member or is qualified to be a member of the Canadian Medical Association is eligible for membership in the Federation on payment of the annual fee of $1.00, half of which is transmitted to the Medical Women's International Association and the balance retained in the treasury. The annual meeting is held at the same time and place as that of the Canadian Medical Association and members are urged to join this body. There are sixty-five charter members enrolled. Following is a list of those holding office at the present time: President: Dr. Helen MacMurchy, Ottawa; *Vice-Presidents*: Drs. Maude E. Abbott, Montreal Que.; Eliza P. Brison, Halifax, N.S.; Mary E. Crawford, Winnipeg, Man.; Mabel L. Hanington, St. John, N.B.; Margaret C. Hogg, Vancouver, B.C.; Ella P. Hopgood, Malpeque, P.E.I.; Rosamond B. Leacock, Calgary, Alta.; J. C. Moloney, Fort Qu'Appelle, Sask. *Hon. Treasurer*: Dr. Elizabeth Bagshaw, Hamilton, Ont. *Hon. Secretary*: Dr. Isabel Ayer, Toronto, Ont.

NINTH CONVENTION OF THE ASSOCIATION OF FRENCH SPEAKING PHYSICIANS OF NORTH AMERICA

The ninth convention of French speaking physicians of North America will be held in Montreal September 21-24, 1926. This convention will be of special importance. South America will be represented by several of its leading medical authorities; and representatives are expected to be present from Belgium, Switzerland and Luxembourg. The Government of the Province of Quebec has sent special invitations to a few members of the French professoriate in Paris, asking them to be present and read papers on special subjects which will be announced later. After the convention it is hoped that a special post-graduate course of ten lectures will be delivered by some of the more eminent visitors. Sir Henry Gauvain of England, Louis Faugeres Bishop of New York and L. E. Phaneuf of Boston will also read papers that promise to be of much interest.

Among the more important subjects which will be discussed are the following; Insufficiency of ventricles; Surgery of gastro-duodenal ulcers; Significance of vertiginous conditions; Social prevention of tuberculosis; Prophylaxis of infantile syphilis.

The following are the names of the physicians forming the Executive Committee; President, Dr. Albert LeSage, Montreal; Vice-Presidents: Dr. P. C. Dagneau, Quebec, Dr. A. Collin, Winnipeg, Dr. O. Menard, Nashua, N.H.; General Secretary of Association, Dr. Gustave Archambault, Montreal; Secretary of the Convention, Dr. Romeo Boucher, Montreal; Treasurer, Dr. H. Aubry, Montreal. The Committee extends an invitation to all Canadian medical men and will gladly furnish further particulars.

The Prince of Wales is to preside over the meeting of the British Association of Science at Oxford next August, and will deliver his address on the evening of August 4th. In it he is expected to deal with the relations between scientific research, the community, and the State both at home and in the Dominions. The Address will be given in the Sheldonian Theatre at 8.30 p.m. It will be relayed to the town hall and will probably be broadcasted generally. This is the ninety-sixth meeting of the association, and the fifth to be held in Oxford. The first took place in 1832 when Professor William Buckland, afterwards Dean of Westminster, was president. At the meeting in 1860 the president was Lord Wrottesley who had already occupied the chair of the Royal Society and of the Royal Astronomical Society. Among the discussions which took place at this meeting was that in which Huxley and Hooper became involved in the famous controvesy with Wilberforce over the Darwinian Theory. In 1894 the president was the Marquis of Salisbury whose address with Huxley's reply revealed that the same controversy was still alive. This year's meeting will have thirteen sections which will work in the mornings and in some instances in the afternoons. At noon on Tuesday, August 10th, Dr. J. S. Haldane will give a lecture on "Acclimatization in High Altitudes". Receptions will be held on August 5th by the Vice-Chancellor of the University and the Mayor of Oxford.

We have received a copy of a blank form to be filled up by patients and afterwards revised by the physician which has been designed by Dr. J. Madison Taylor of Philadelphia and is published by the F. A. Davis Company of that city. It is very detailed but may be of considerable service to physicians in obtaining a complete clinical history in cases demanding special elucidation.

Fellowship of Medicine.—A post-graduate course in diseases of the chest will be delivered at the City of London Hospital for Diseases of the Heart and Lungs, June 14th to 26th. The fee for the course is two guineas and the names of those wishing to attend should be sent to the Secretary of the Fellowship of Medicine, 1 Wimpole Street, W.1., before June 1st.

Also a course of post-graduate instruction in urology will be given at All Saints' Hospital, Fauxhall Bridge Road, S.W., June 7th to July 3rd. The course will consist of four lectures followed by clinical and cystoscopic demonstrations given at the hospital. The fee for the course is five guineas. The names of those desirous of attending should be sent to the Secretary of the Fellowship by June 3rd.

NEW BRUNSWICK

Dr. H. A. Farris of the Saint John County Hospital has lately returned from Montreal where he appeared before the Montreal Medico-Chirurgical Society to present a paper on, "Phrenecotomy in the treatment of tuberculosis." While in Montreal, Dr. Farris renewed acquaintance with many of his old-time friends.

Word was received on May 7th that Hon. Dr. D. V. Landry, former Provincial Secretary-Treasurer, had suffered a slight stroke of paralysis at his home in Buctouche. At latest reports, Dr. Landry was resting comfortably. It is reported that he will be able shortly to resume his active life. He was attended by Dr. J. Euclide Leger of Moncton.

On April 23rd the monthly meeting of the Saint John Medical Society was addressed by Drs. K. MacKenzie and H. R. Atlee of Dalhousie University. Dr. MacKenzie spoke on the various aspects of heart failure, covering particularly the treatment of this condition. Dr. Atlee's address was on the subject of septic abortion. These papers were extremely practical and, therefore, of more interest than usual. These two gentlemen also appeared in Fredericton, Woodstock, Moncton and Campbellton and the reports from these centres are equally flattering. It is the opinion of the writer and of many of his confrères, that the type of paper presented by these, our latest visitors, would be hard to improve upon as the message contained, reaches each and every one of us in general practice.

A dispatch from Ottawa noted in the local press the other day stated that following an agreement between the Departments of Health and Marine and Fisheries, the leper colony at Tracadie, N.B. will soon be closed and the small colony, consisting of twelve people, will be transferred to Grosse Isle, Quebec, where they will be placed under the care of the medical authorities at the Quarantine Station. This colony at Tracadie has been in existence for nearly one hundred years.

The quiet tenor of medical practice in Saint John has within the last few days been enlivened by newspaper reports of a little brush between several local physicians and a local chiropractor. This matinee

was staged in the coroner's court at Fairville and revolved about the treatment given to a child suffering from pneumonia by the said chiropractor. The coroner's jury brought in a verdict finding that the said child had died of pneumonia and that in their opinion, chiropractic had had a detrimental effect but that death would probably have taken place in any event. The jury added a rider to the effect that as the legislature had set a very high standard for the qualification of medical practitioners, that they recommend that immediate steps should be taken to secure legislation to decide who should be deemed qualified to practice chiropractic and to what extent the art should be exercised; as a protection to the public who must suffer or benefit by the service rendered. (Quotation from the local press)

At the meeting of the Saint John branch of the Society for the Prevention of Tuberculosis held on May 11th, Dr. Farris outlined some plans for the summer work, especially along the lines of a campaign of education in tuberculosis matters, that is to be carried on in the Maritime Provinces this year and for the following two years. He intimated that Sir Henry John Gauvain of London, England, and Dr. Stewart Pritchard of Battle Creek will be in the Maritimes as the guest of the Canadian Society this summer. This work elicits marked interest both from the medical practitioners and laymen throughout the territory.

It is with regret that we have heard of the severe illness of Dr. G. G. Melvin, Chief Medical Officer of the New Brunswick Department of Health. Dr. Melvin was taken ill at his home in Fredericton and has lately been removed to Montreal for further treatment. It is to be hoped that his recovery will be swift and that he may return to us at the earliest moment.

In the annual report of the Chief Medical Officer, Dr. Melvin pays a very fine tribute to the work of Dr. J. A. Wade on his retirement from the public health services. Dr. Melvin in his eulogy stated that "No one has ever served seven years in any position with greater loyalty to it and diligence than has Dr. Wade" and this department, and, I am persuaded his district will hold his name in grateful remembrance.

Dr. Wm. Warwick, District Medical Officer at Saint John represented the New Brunswick Department of Health at the meeting of the Canadian Public Health Association at Toronto. He reports a very interesting meeting of considerable value to public health workers.

Dr. H. L. Abramson, Provincial Pathologist, has been very seriously ill at the General Public Hospital in Saint John. The doctor suffered from a very serious cellulitis and a lymphangitis in his left hand and arm which for a time was quite threatening. The doctor's confrères are much pleased that he has now been able to return to work, practically recovered from his serious infection.

A. S. KIRKLAND

QUEBEC

A general dispensary will be established in Verdun with Dr. R. M. H. Power in charge. The health department of the city will be credited with a sum of $5,500 by the City Council for the purpose of purchasing equipment, and for operation expenses. Two nurses will be engaged to attend during the day time. Treatment will be given to all minor ailments, including those necessary for the teeth . It will be free for the indigent, while those who have the means of paying, will be charged. According to Mayor Dupuis twenty-two doctors have volunteered their services and will be available for clinic work.

Nearly 400 degrees and diplomas will be conferred at the forthcoming convocation of McGill University, to be held on May 28th in the Capitol Theatre. It is announced also that two distinguished figures in the medical world who have previously been awarded honorary degrees, but have not hitherto been able to attend to receive the honour, will also be present Sir Berkeley George Moynihan, K.C., M.G., C.B., of the Army Medical Advisory Board, professor of Clinical Surgery at the University of Leeds, England, Honorary Fellow of the American Surgical Association and a member of the Royal College of Surgeons in England was awarded a degree at a meeting of Corporation of McGill in April, 1922, and has telegraphed that he will attend convocation this month to receive the honour. Dr. David M. Cassidy, medical superintendent of the Lancaster Mental Hospital, England, and a graduate of McGill, Med. '67, who was awarded an honorary degree at the meeting of the Corporation in April last year, has also signified that he will be present.

Two coaches will be operated as hospital cars on the Laurentian route of the Canadian Pacific Railway twice a day during the week and once on Sundays. The idea of running hospital cars has been initiated owing to the large number of stretcher cases travelling between Montreal and the Ste. Agathe Sanatorium. It was also felt by the railway officials that such a service would be very useful in handling accidents during the summer vacation period in the Laurentians and during the skiing season in winter. First-class cars have been converted into hospital rooms in such a way as to easily take care of sick or injured persons; they will be attached to the baggage car and entered through it, so that stretcher cases are assured privacy and can be easily handled, being taken directly from the platform.

Dr. Auguste Pettit, of Paris, has arrived in Montreal, to direct tuberculosis research in Canada, and possibly establish a branch of the Pasteur Institute here.

La Societe Medicale de Montreal held its Canadian Medical evening at the University of Montreal under the auspices of the Post-Graduate Fund of the Canadian Medical Association. The speakers were presented by Dr. Leo. Pariseau, president of the Societe Medicale; Dr. J. G. Fitzgerald, Professor of Hygiene and Preventive Medicine addressed the meeting on the "Specific control of some of the communicable diseases through immunization." Dr. A. Brosseau, director of L'Hopital Saint Michel, Archange of Quebec, read a paper on "Les etats d'epuisement-leurs manifestations neurologiques et psychiatriques."

An endowment of a quarter of a million dollars has been given to the Shriners' Hospital for Crippled Children on Cedar Avenue by a prominent Montreal business man, who wishes to remain anonymous. The gift is stated to be due to the sight of little Cecile

Gagnon playing and romping with her friends for the first time in her life.

The annual general meeting of the corporation of Saint Mary's Hospital was held in its new outdoor department. The report showed that the hospital has been brought to a standard which fulfils all the requirements of a properly organized hospital, including medical, surgical, metabolism, and outdoor departments, and a standard training school for nurses. Owing to the fact that there are only four beds out of a total of fifty for private patients, the financial report shows a substantial operating deficit for the year, but the statement of assets and liabilities shows the hospital is in a satisfactory financial position. It has been established and fully equipped as a modern hospital at the cost of $2,000 per bed. The great need for larger quarters was stressed by all reports.

The annual meetings of the American Otological, American Laryngological and the American Laryngological, Rhinological and Otological Societies and the American Bronchoscopic Society, will take place in Montreal, beginning the 29th of May and ending the 5th of June. Sessions will be held at the Mount Royal Hotel on the ninth floor and to the general meetings the profession is welcome. A distinguished visitor, Professor R. Magnus of the Imperial University, Utrecht, Holland, is to be the guest of the Societies and is to place before the members some original research work, which he has carried on in the internal ear.

The Mental Hygiene Committee of Montreal opened a mental health clinic in the health centre of the Montreal Anti-tuberculosis and General Health League at 9 Coursol Street. This Clinic will be held every Thursday at 2 p.m. and will serve this section of the community in an endeavour to deal with mental health problems from the standpoint of prevention and treatment. "It cannot be stated too often" said Dr. W. T. B. Mitchell, medical director of the committee, "that prevention is the most important function of such a clinic. In a community service, however, persons now suffering from mental diseases must not be neglected. At the present time, one child in twenty-five now growing up will, unless adequate preventive measures are instituted, suffer a definite mental breakdown. Directors of established psychiatric and mental hygiene clinics claim that admission rates to mental hospitals in their districts have shown a decided decrease. In addition to this new clinic, the established facilities for the prevention and treatment of nervous disorders in which this committee is actively engaged, include the psychiatric clinic at the Royal Victoria Hospital, held on Tuesday and Friday afternoons.

Le Comte executif, du IXe congres des Medecins de Langue francaise de l'Amerique du Nord a l'honneur de porter a votre connaissance que le congres se reunira a Montreal les 21, 22 et 23 septembre 1926.

Les rapports porteront dur les sujets suivants:

(a) Medecine: Insuffisance ventriculaire;

(b) Chirurgie; Traitement chirurgical de l'ulcus gastrique et de l'ulcus duodenal;

(c) Hygiene Sociale: Prophylaxie de la syphilis infantile; Prevention sociale de la tuberculose;

(d) Specialites de la tête; Interpretation des etats vertigineux;

(e) Interets professionnels; L'hopital et le praticien.

GEORGE HALL

ONTARIO

Dr. James Lyons Biggar of Toronto has been appointed chief administrative officer of the Red Cross in Canada with the title of Chief Commissioner. Dr. Biggar is a graduate of Toronto University in 1903; while yet an undergraduate he served with the Tenth Field Hospital in the South African War. During the world war he went overseas as medical officer of the 88th Regiment, and latter organized the 13th Canadian Field Ambulance. For the past two years he has been A.D.M.S. in the D.S.C.R.

The Academy of Medicine, Toronto, held its nineteenth annual meeting on May 4th. Striking features of the annual report were the facts that the membership now reaches the large figure of 815, and that there are now over 17,000 volumes in the library. As a result of the elections which took place Dr. F. N. G. Starr becomes president, Dr. A. J. MacKenzie vice-president, Dr. R. S. Pentecost, honorary secretary, Dr. Brefney O'Reilly, honorary treasurer. The Canadian Health Congress, the Dominion's first national health convention, met in Toronto during the week of May 5th. The convening of this congress brought together the Canadian Public Health Association, the Ontario Health Officers' Association and the Council of the Canadian Social Hygiene. A long and interesting programme had been arranged, which included papers, laboratory demonstrations and exhibitions of the many details which help in the carrying out of the principles concerned with the preservations of public health. Amongst the many papers and contributions should be mentioned "Public opinion in relation to science in general and public health in particular" by Dr. G. E. Vincent of the Rockefeller Foundation. "Periodic health examination" by Dr. Haven Emmerson, Professor of Public Health Administration, Columbia University, "New points in regard to ventilation" by Dr. C. E. A. Winslow, Professor of Public Health, Yale University, and the addresses of the presidents of the various associations, Dr. G. D. Porter, Dr. F. Adams and the Honorable Justice Riddell. The congress was banqueted by the Government of the Province at Hart House on Wednesday evening and were there addressed by the Honorable Forbes Godfrey and Dr. Charles J. Hastings. A joint meeting of the Academy of Medicine took place on May 6th in Osler Hall. Dr. George D. Porter was re-elected as president of the Canadian Public Health Association, Dr. McKay of Oshawa was elected president of the Ontario Health Officers' Association, and the Honorable Justice Riddell president of the Canadian Social Hygiene Council.

The Orthopædic Hospital of Toronto is making a campaign to acquire $175,000 for improvements and building. The campaign will be carried on from June 4th to the 18th.

A drive for $500,000 with which to begin the erection of the East End Hospital in Toronto began on May 10th. The hospital need of this part of the city have been set forth in a comprehensive statement which amongst other things states that east of the Don river there is a city the size of Winnipeg with no hospital, and that when completed *this will be the*

only big hospital in Toronto where free patients can bring in their own doctors. The city has purchased a property of six and one half acres at Coxwell and Sammon Avenues. The campaign headquarters of the Toronto East General Hospital are at 133 Danforth Avenue. Sir John Aird, president of the Canadian Bank of Commerce is the honorary treasurer of the committee appointed to collect funds. Joseph H. Harris, M.P., is chairman; E. B. Ryckman, K.C., M.P., is the chairman of the special sub-committee, and R. O. Darling is the campaign manager.

On April 9th, at a meeting of the Sault Ste. Marie Medical Society, Dr. R. G. Armour gave a talk on "Borderline mental cases," preceded by a clinic.

The Welland County Medical Society met on April 20th at Welland. An address was given by Dr. F. J. H. Campbell of London on "Common disorders of the heart."

At a meeting of the Oxford County Medical Society held at Woodstock on April 21st, Dr. A. A. Fletcher of Toronto gave a talk on "Diet and insulin in the treatment of diabetes mellitus."

On April 23rd, Dr. F. B. Mowbray of Hamilton gave an address on "Hospitalization", to a joint meeting of the Trustee Board of the Galt General Hospital and the South Waterloo Medical Society.

The Brant County Medical Society met on April 29th, Dr. Leonard Murray of Toronto gave a talk on "Cardio-vascular syphilis."

The Porcupine District Medical Society held a meeting at Timmins on April 30th, Dr. A. S. Moorhead of Toronto gave an address on "Diseases of the rectum."

Dr. J. Hepburn of Toronto addressed the Sudbury Medical Society on April 30th on "The diagnosis and treatment of myocardial failure."

The Lincoln County Medical Society met at St. Catharines on May 5th, Dr. W. G. Cosbie of Toronto gave a talk on "The use and abuse of forceps."

At a meeting of the Perth County Medical Society held at Stratford on May 6th, Dr. W. W. Lailey of Toronto spoke on "The care of the expectant mother."

North Halton Medical Society held its annual meeting at Guelph on May 4th. Dr. Argue of Mount Forest was elected as president. Addresses were given by Dr. H. B. Van Wyck and Professor Duncan Graham of Toronto.

On April 30th, Dr. G. C. Cameron addressed the North Waterloo Medical Society at Kitchener, his subject being "Intravenous therapy in blood stream infections."

The Elgin County Medical Society met at St. Thomas on May 7th; Dr. A. A. Fletcher gave an address on "Diet and insulin in the treatment of diabetes mellitus."

On May 10th, the North Bay Medical Society was addressed by Dr. W. P. Tew of London, his subject being "The toxæmias of pregnancy."

Dr. H. S. Hutchison of Toronto addressed a meeting of the Hastings County Medical Society at Belleville on May 12th, his subject being "High blood pressure and arteriosclerosis."

A meeting of the General Committee of the Osler Memorial Committee authorized by the Hamilton Medical Society, was held on Wednesday evening, April 21st. At this meeting the Sub-committee on Programme or Plans and the Sub-committee on Publicity or Information submitted reports in which they stated that they had completed their organization and had subdivided each of these committees into nine sections, with a convener for each section. The Executive Committee also reported interesting details regarding progress made up to date, including a reference to the Chairman's visit made to Boston and Montreal where he had received very promising encouragement. After these reports were received and approved, the Committee decided to disband. It is expected that during the coming year, the new Executive of the Medical Society will appoint another Committee to continue the work, and that there will arise, through the activities of the Wentworth County Medical Society, a suitable memorial to Sir William Osler.

N. B. GWYN

The April meeting of the York County Medical Society was held on the afternoon of Thursday, April 29th, at the Toronto Western Hospital. A clinic was given by the Surgeon-in-Chief of this institution, Dr. H. A. Beatty, who was ably assisted by several members of his staff, on "The surgical aspects of gall bladder diseases" and "Of the various types of goitres." The meeting was well attended and all present felt that once again the York County Society had spent a very profitable afternoon.

S. W. OTTON

MANITOBA

The outside speakers for the extra-mural post-graduate tour of Manitoba in June will be Dr. Jonathan C. Meakins and Dr. J. A. Nutter of Montreal. The itinerary calls for a luncheon at the Winnipeg General Hospital on June 8th, and a meeting in the evening under the auspices of the Winnipeg Medical Society, afternoon and evening meetings at Portage la Prairie and Minnedosa, an afternoon meeting at Brandon, a week-end at Ninette and afternoon and evening meetings at Morden. Dr. Meakins will speak on pneumonia and Dr. Nutter on sciatica and low back pain.

The shareholders of the Medical Arts Building, Winnipeg, have decided to add two new stories to the present four storey building. Mr. Geo. Northwood is the architect and Messrs. Hazelton and Wallin the contractors. The addition will provide space for some forty doctors and dentists.

Work has begun on the erection of the additions to Misericordia and St. Joseph's Hospitals which will provide respectively two hundred and one hundred additional beds.

On the eve of his departure for Windsor, Ont., where he will engage in practice, Dr. Geo. Hassard was the guest of honour at a dinner given by the doctors of Portage la Prairie district. Dr. C. C. Simpson (Man. 1924) will succeed Dr. Hassard.

Dr. F. H. Coppock has taken over the practice of the late Dr. A. B. Stewart at Rosthern, Sask., and Dr. W. J. Boyd, late of the interne staff of the

Winnipeg General Hospital has begun practice at Estevan, Sask., with Dr. J. F. Creighton and Dr. F. B. Walsh.

Dr. R. T. McGibbon, Assistant Professor of Anatomy in the University of Manitoba has accepted the post of Professor of Anatomy in the University of Saskatchewan and will leave Winnipeg shortly for Saskatchewan. He has made many friends in the medical profession and among the medical students as well as in the Scientific Club of which he was a valuable member.

There will be a large contingent from Manitoba at the annual meeting of the C.M.A in Victoria.

ROSS MITCHELL

SASKATCHEWAN

A meeting of the Regina District Medical Society was held at the General Hospital when a very excellent paper was given by Dr. F. A. Corbett on gastric ulcer, bringing out many new points in pathology and etiology. Dr. W. R. Coles also gave a very interesting paper on cardiac arrhythmia covering the anatomy and physiology as well as the diagnosis in a very comprehensive manner. Both the above papers were well received and the speakers were accorded a hearty vote of thanks.

A meeting of the Battleford District Medical Society was held at the Mental Hospital on January 15th. Dr. A. R. Munroe of Edmonton presented a paper on fractures illustrated by lantern slides, in which he covered thoroughly the treatment of fractures, simple and operative. A very interesting discussion followed. A very hearty vote of thanks was tendered Dr. Munroe for his excellent paper. Dr. Jardine also delivered an address on lobar pneumonia. This was followed by an interesting discussion.

After discussing many items of business interest the annual election of officers took place, which resulted as follows: President, Dr. L. A. C. Panton; Vice-President, Dr. J. H. Jackson; Secretary-Treasurer, Dr. F. H. Hurlburt; Executive Committee, Drs. MacNeill, Jardine, Rose, Hamelin and Nunn.

Dr. J. H. Blair, who formerly practised at Gull Lake, Sask., is now located at Fernie, B.C.

A well attended monthly meeting of the Regina and District Medical Society was held April 21st in the General Hospital. Dr. Coles gave a paper on cardiac arrhythmia; Dr. Corbett on gastric ulcers. The Weyburn and Yorkton Societies which had been invited to attend this meeting had sent representatives.

Dr. O. E. Rothwell of Regina has returned from an extended trip to the Pacific coast cities.

Dr. Sahlmark who has been some years at Saltcoats and is the present M.L.A. for that constituency has moved into Regina to practise.

Dr. Hugh McLean has left for Europe with the Interstate Post-Graduate Society.

Dr. M. A. Currie whose marriage to Miss Elizabeth Cleland of Toronto took place on April 6th has returned with his bride, to practise in Regina.

Dr. D. S. Johnstone who has been in hospital with influenza is practising again.

Dr. McMurtry of Regina has returned from the Mayo Clinic where he spent some time.

The lack of accommodation in the Regina General Hospital becomes more acute, there being a constant waiting list for admission.

The chiropractors of Saskatchewan have again approached the Government. In session of parliament or out of session they are always at it, showing the vigilance which is required by organized medicine, if we are to protect the public from unqualified practitioners.

The May monthly meeting of the Regina and District Medical Society was held Wednesday, May 19th, following a banquet in the Parliament Buildings. The Moose Jaw Society were our guests, and had fifteen members present. Dr. French gave a paper on "Puerperal sepsis." Dr. Connell on "Radium treatment of malignant tumours." Both papers were very excellent and called forth considerable discussion. Out of town men were represented by, Dr. Seigf, Earl Grey, Dr. Bromley, Estevan, Dr. Tucker, Francis.

There has been considerable discussion recently in Regina about the urgent need for some action by the Canadian Medical Association to undertake the standardization of our Canadian hospitals. It would appear that the medical profession of Canada are dormant, as no other profession would allow a foreign organization to standardize them, or the institutions for which they are responsible. It is hoped that some action may be taken at the forthcoming meeting in Victoria.

Dr. G. C. Currie, of Little Current, Ont., has started practice in Regina.

Dr. H. C. George of Regina has left with the government expedition to the Arctic circle which makes the annual trip under the Indian Department to pay treaty money to the Indians.

R. MCALLISTER

ALBERTA

Dr. Morley Salmon of Calgary, left recently for a holiday in Ontario. We trust that he may soon recover from the effects of his recent illness.

Dr. J. G. Sweeney, who formerly practised in Wayne, is now associated with Dr. T. H. Ross at Drumheller. Dr. H. Barden of Retlaw has taken over Dr. Sweeney's mine contract at Wayne.

Among the recipients of the M.D., C.M. degrees at the recent Convocation of the University of Alberta, was Professor J. B. Collip, one of the co-

discoverers of insulin, and one who has greatly advanced our knowledge of the parathyroid glands through the isolation of the specific hormone. He was given a rousing reception when his degrees were conferred.

Dr. M. J. Brayton of Gadsby, has relinquished his practice to accept a position in an Ohio hospital.

Dr. Walter Morrish of Smoky Lake, is now in London, England, doing post-graduate work under Sir John Thompson Walker.

Dr. Sterling McGregor has taken charge of Dr. J. M. Armstrong's practice in Calgary, whilst he is in the east taking post-graduate work.

Dr. F. J. Stewart of Stavely, who recently recovered from a serious illness, is now spending a few weeks in Victoria, B.C.

Many Calgary physicians are thinking in terms of "oil" these days, with visions of forthcoming "gushers". Some have had considerable experience with anticlines and declines.

The following physicians have recently registered with the College of Physicians and Surgeons of Alberta: Horace Orville Wilson, Frank Melville Lucas, Hector McKenzie, William Darley McPhail, Hugh Alexander Robertson, Wolf Auerbach.

The Alberta Council of the College of Physicians and Surgeons has under discussion with the various Councils of the different provinces in Canada, the question of having a common form of certificate which would have to be presented by every applicant for registration, and which would show whether his standing in the province where he formerly practised, was good or not. If this plan were adopted, more difficulty would be encountered by a member of the profession whose record was not good, in seeking registration in another province. Such a certificate as suggested would be signed by the registrar of the province where the applicant previously practised.

May we hope that every physician in Alberta will do his best to attend the annual meeting of the Canadian Medical Association in Victoria, June 21st to 25th.

The following have been selected as Alberta representatives on the various committees of the Canadian Medical Association:

Legislation.—Dr. F. W. Gershaw, Medicine Hat, Dr. G. D. Stanley, Calgary.

Medical Education.—Dr. J. J. Ower, Edmonton, Dr. C. E. Smyth, Medicine Hat.

Constitution and By-laws.—Dr. W. Merritt, Calgary, Dr. A. F. Anderson, Edmonton.

Intra-Canadian Relations.—Dr. W. S. Galbraith, Lethbridge, Dr. J. S. Wright, Edmonton.

Ethics and Credentials.—Dr. A. E. Archer, Lamont, Dr. Neil MacPhater, Calgary.

Public Health.—Dr. A. C. Franklin, Edmonton, Dr. D. Gow, Calgary.

Economics.—Dr. F. A. Nordbye, Camrose, Dr. H. K. Groff, Edmonton.

Pharmacy.—Dr. F. W. Stockton, Calgary, Dr. Irving Bell, Edmonton.

A copy of Bill No. 78 of 1926 is at hand, this being "An Act to provide a Board to Deal with the Discipline of the Professions." Since the final reading of this Legislative Act has been deferred until the next session of the new Legislature, it is possible that this much-discussed enactment will find its way to the Statute Books.

I have before me the recent Bulletin issued by the College of Physicians and Surgeons of Alberta, and take the liberty of quoting the following comments on this iniquitous Bill:

"You will note in reading the Act, that the following points stand out in bold relief:

1. The Cabinet of the Local Legislature appoints the Board, decides of how many it shall be composed, and who are the individual members, and the matter is dealt with behind closed doors.

2. The appeal from the Discipline Committees of the various professions is to be this board.

3. Where any professional Act provides that the member disciplined can now appeal to the Courts for another hearing, that right is taken away.

4. Where any professional Act does not provide, that the member disciplined may be prohibited from practising his profession, this new Board has the power to thus prohibit him.

5. This new Board is given the powers to commence an investigation against any member of any profession, and punish as they see fit, without any reference to the governing body of that particular profession.

6. The new Board of its own volition, may reopen any charge against any member, after he has been disciplined by his own profession, and do as it pleases even to depriving him of his rights under his license.

7. The new Board's decisions are final, like the laws of the Medes and Persians, and cannot be amended, altered, modified, or set aside by any court of the land.

8. When investigating or trying members of any profession, the Board may if it chooses call a member of the profession under consideration, to sit as assessor, but if it does not so choose, it cannot be compelled to.

9. When once a man has been prohibited from practising his profession he cannot be reinstated without the Board's consent.

10. The new Board makes its own regulations subject to the consent of the cabinet, and the professions must be governed by such rules, to which it has been no party, and has no appeal to any court in the matter.

11. The Provincial Cabinet in secret session has power to make regulations defining:

(a) Unprofessional conduct.
(b) Fitness of a professional man.
(c) Basis of tests of fitness of any professional man.
(d) Basis under which any unqualified man may violate any act governing any profession.

12. These Cabinet regulations passed behind closed doors, are valid as soon as passed, but must be reported to the next meeting of the Legislature. They remain in operation unless the Legislature chooses to alter them, which would mean practically a vote of "Want of Confidence" in the party in power. Imagine how easy this would be.

13. All professions do not have to come under the Act, automatically, just those the Government chooses to put under the Act, and this is to be done in secret.

14. In short a man's accounts can come under review by the Board which will have power to reduce without the professional man having a chance to appeal.

We might state that so far the Government has not cited a single instance where any man has been guilty of any offence that would be judged a good reason for the passing of such an Act."

Further comment is not necessary, excepting to state that where a Canadian citizen's right to appeal to the Courts of Justice in this fair land has been

abrogated, we may be certain that we are entering on an era of intolerance characterized by inquisitionery procedures.

It is to be hoped that a sense of British fair play may assert itself when this Act is brought forward for its final reading, and that it may be assigned to the oblivion which it so well deserves.

G. E. LEARMONTH

BRITISH COLUMBIA

Members of the B.C. Medical Association are reminded that the annual meeting will be held at the Empress Hotel, Victoria, at 3.45 p.m. Tuesday, June 22nd. An Association dinner will be held at 6.15 p.m. At 8 p.m. officers for the ensuing year will be elected and any further necessary business transacted. As this meeting is being held during the week of the Canadian Medical Convention a very large attendance is expected.

The annual meeting of the No. 6 District Medical Society was held at Nanaimo on April 9th, when Dr. W. D. Keith of Vancouver gave a much appreciated address on "Some clinical problems of treatment of goitre". Officers for 1926-27 were elected as follows: Dr. W. Ross Lane, Nanaimo, President; Dr. T. L. Buttars, Courtenay, Vice-President; Dr. W. E. J. Ekins, Nanaimo, Honorary Secretary-Treasurer; Dr. W. Fred Drysdale, Nanaimo, Representative on B.C. Medical Association Executive.

Dr. H. W. Hill, Director of Laboratories, Vancouver General Hospital, has been appointed to represent the B.C. Medical Association on the Board of Governors of Victorian Order of Nurses of Canada. As Dr. Hill was, until recently, on the Board of Governors as a member from London, Ontario, this will renew his connection with the Board in a very happy way.

The following letter, dated March 29, 1926, has been received by the Executive Secretary from the Vice-President of the Canadian National Railways, Montreal:

"On behalf of the Radio Department of the Canadian National Railways (over which I have jurisdiction), I beg to express appreciation of the address delivered by you from our radio station C.N.R.V. on the 16th instant, as also your undertaking to give from that station a series of health talks. It is, I can assure you, a great encouragement to the Department in its efforts to maintain a high standard of such entertainments to have the co-operation of men of your attainments."

Such comment is very gratifying, as it shows that we are on the right path in our efforts at publicity. *The Vancouver Daily Star* has been added to the list of daily newspapers publishing these articles, and we must again take this opportunity of thanking the New York State Health Department for its courtesy in allowing us to use its articles. They are carefully prepared for broadcasting, and in addition to being readable, are accurate and informative.

Our Executive Secretary, Mr. Fletcher, has just returned from his annual tour through the Okanagan and Kootenays, where he met practically every physician practising in this area. He was received cordially by every man visited, and was able to discuss medical matters fully with them, as these affect the province.

A meeting of the Fraser Valley Medical Society was held on April 1st, Dr. G. T. Wilson, President of the Association, in the chair. Twelve members were present. A very profitable and enjoyable evening was spent in a debate as to whether it is more advantageous to remove the gall bladder than to drain it. The judges decided in the affirmative.

The Royal Columbian Hospital has set aside a room for autopsy work and is equipping it with the most up-to-date and efficient equipment to do necropsy work.

Dr. A. L. McQuarrie, of Mission, B.C., has disposed of his practice at that place, and is now practising at New Westminster.

Dr. J. H. MacDermot, of Vancouver, has been appointed to represent the B.C. Medical Association on the Board of Trustees in connection with the proposed Preventorium, to which the Rotary Club of Vancouver has given $10,000.

We call the attention of our readers to further particulars which appear in this issue of the meeting of the Canadian Medical Association, in Victoria, on June 21st to 25th. There is no need to extol to residents of British Columbia the advantages of Victoria as a Convention City. Its climate, the beauty of its setting and surroundings, and the adequate accommodation, are known to all. We believe that the programme reveals an intellectual treat of no mean order. Headquarters for the Convention will be at the Empress Hotel.

At the annual meeting of the Vancouver Medical Association held on the 20th of April, Dr. A. W. Hunter was unanimously elected President, Dr. A. B. Schinbein was elected Vice-President; Dr. W. S. Turnbull, Treasurer; Dr. Fred Brydone-Jack, Secretary. The retiring President, Dr. J. A. Gillespie reported a very successful year's work, seven special meetings having been held in addition to the regular monthly meetings of the Association.

Dr. N. E. MacDougall was recently a patient in St. Paul's Hospital suffering from a very severe cellulitis of the face and scalp. His friends will be pleased to know that he is now at home again and progressing favourably towards complete recovery. He hopes to be able to resume practice shortly.

Dr. T. F. Saunders has been a patient in the Vancouver General Hospital where he underwent a gastro-enterostomy. For a time his friends were very anxious about him as symptoms of intestinal obstruction developed, but he is now convalescing quite satisfactorily and hopes to return to practice very soon.

Dr. H. W. Hill, Professor of Public Health at the University of B.C. spent a busy thirty-six hours recently in Portland, during which time he vaccinated some fifty nurses and members of the Oregon State Medical Society, as well as delivered six addresses to the Medical Society, the Oregon State Health Officers' Convention and other affiliated organizations.

The arrangements for the 1926 session of the Vancouver Summer School are nearing completion.

The programme as at present arranged includes such men as Sir Henry Gauvain, from England; Dr. George Gellhorn, of Chicago; Dr. A. Warthin of Ann Arbor, Michigan; Dr. Hale, of Western University; Dr. Gurd of McGill and Dr. R. R. McGregor of Queens. The meetings this year will be held in the week of September 13th.

Dr. W. D. Keith, of Vancouver, has been asked to take part in a symposium on "goitre" at the meeting of the Canadian Medical Association at Victoria in June.

At the regular monthly meeting of the Victoria Medical Society held on May 3rd, in the Library Room, and attended by thirty members, the recent progress of obstetrics and gynæcology was reviewed by Dr. A. E. McMicking, and some interesting writings in the newer literature on pædiatrics were collected and presented by Dr. Stuart G. Kenning.

The programme of the annual meeting of the Canadian Medical Association was explained to the meeting by the Local Secretary, Dr. M. W. Thomas. Much general business was discussed and dealt with.

With the endorsement of the Victoria Medical Association, Dr. W. A. Dobson of Vancouver opened a Mental Hygiene Clinic, under the auspices of the Social Service League, in Victoria on March 24th. Present plans are for monthly clinics.

On Thursday evening, April 22nd, Dr. Dobson gave the annual address before the League, his subject being "The aims of the mental hygiene clinic in a community."

UNITED STATES

The medical service of the United States Veterans Bureau through its director has appointed a Board of Physicians to study the residual effects of war gases. In its circular note it states that the board is not concerned with the better known and more immediate effects of war gases, but particularly desires information as to whether any war gassing received in action, had resulted in a disability relatively lasting and permanent; whether it has caused any lasting pathological change, and if so what organs or systems have been by it permanently affected or disturbed, and what symptomatology was present under those circumstances.

The Board states it will appreciate any information which any of those connected with the war service in Canada may be able to give, it being understood that any remarks so offered are not to be used in any other way except in the elucidation of the above points.

Bills are also pending in Congress to authorize operations under the Shepherd Towner Act for two years beyond the limit originally fixed for the termination of such activities. *The Journal of the American Medical Association* appeals to constituent societies to protest to their senators and representatives against any bills to extend the life of this act. It states that the evidence offered by the proponents of the pending legislation to justify its enactment, so far as such evidence is available, is of a most general and uncertain character and much of it comes from interested witnesses. Certainly it is not such as to convince any person accustomed to weigh evidence that the Shepherd Towner Act has reduced or ever will reduce maternal or infant mortality beyond the reduction that the states themselves might effect. Those who believe that the Shepherd Towner Act is essentially pernicious will do well to continue their efforts to defeat any legislation looking toward the extension of the act for any period whatever.

At the meeting of the American Medical Association in Dallas, Dr. Jabez North Jackson, of Kansas City , Missouri, was elected to the position of President-Elect of the Association. His father John Wesley Jackson was at the time of his death vice-president of the Association. Dr. Jabez North Jackson took his A.M. degree from Central College, Fayette, Missouri, in 1890, and obtained his degree in medicine from the University Medical College in Kansas City in 1891. He then went to New York for post-graduate study and returned to take the position of Demonstrator of Anatomy in his *Alma mater* which he held till 1895 when he was made Professor of Anatomy. In 1898 he became Professor of Surgical Aanatomy and Adjunct Professor of Surgery; in 1900 he was again raised and made Professor of Practical Surgery and Clinical Surgery, a position which he occupied till 1911. From the beginning of his medical career Dr. Jackson has been interested in the affairs of medical organization. He was President of the Medical Association of the South West in 1898, of the Kansas City Academy of Medicine in 1900, of the Missouri State Medical Association in 1904. He also has been prominent as a member of the Missouri Valley Medical Society and of the Pan-American Medical Congress.

Although physicians in the United States have convinced Congress of the unjustness of the extra tax they have been obliged to pay in connection with the Harrison Narcotic Act, and it is to be removed on July 1st, another bill on the matter is being introduced into Congress limiting the right of physicians to use narcotics and imposing additional duties on them with respect to such narcotics as they may lawfully use besides greatly increasing the penalty for violations of the act, intentional or unintentional. This legislation is regarded as in effect a confession by the officers charged with the execution of the Harrison Narcotic Act, that in its present form it cannot accomplish the purpose for which it was passed.

"Well, Mrs. Johnsing," announced the coloured physician, after taking her husband's temperature. "Ah has knocked de fever out of him. Dat's one good thing. "Sho'nuff," was the excited reply! "Does dat mean dat he's gwine git well, den?" "No," replied the doctor, "dey's no hope fo' him; but you has de satisfaction ob knowin' that he was cured befo'e he died."

Book Reviews

Notes for Diabetics. By Walter R. Campbell, M.A., M.D. (Tor.) Department of Medicine, University of Toronto, and Mame T. Porter, B.Sc., Dietitian, Toronto General Hospital; University of Toronto Press, 1926.

This is a small octavo volume with flexible covers, and about 130 pages, interleaved for notes, and is written with the intention of instructing the diabetic patient after leaving the hospital, to work out his own diet, and co-operate intelligently with the orders of his physician.

Although it may be said that drastic restriction in diet, except in the more severe cases, no longer characterizes the management of diabetes, it is still absolutely important that those measures that have proved of the greatest value in the treatment of diabetics without insulin, should be persevered with; the urine must be kept sugar free; both overnutrition and extreme undernutrition should be avoided, and the daily routine of work should be made compatible with the strength that such a diet affords. It is therefore particularly necessary that the patient should understand the fundamental principles on which his diet is ordered, and the dangers that may arise on any deviation from these principles. In this book all these points are clearly brought out. After a statement of the nature and cause of diabetes there is an excellent and brief statement of the principles involved, in arranging a diet. This is followed by one on food measurement. Not only are instructions given how to construct a suitable dietary so far as its constituents may be concerned, but an effort is made to make this diet palatable and afford sufficient change to tempt the appetite. Excellent rules are given on the construction of menus. Insulin is described, and its dangers, if given in unnecessarily large doses. Short chapters on ketosis, acidosis and coma, on the influence of infections and on urinalysis follow. The last half of the book contains notes on food equivalents, recipes for making all sorts of palatable dishes, and ends with a chapter on the canning of fruits and vegetables for winter consumption.

We know of no other work that in such simple language, and in such a clear style, gives all the details which a diabetic patient should know regarding his condition and its treatment. The book can be strongly recommended to the profession as one suitable to place in the hands of their diabetic patients. It contains also many interesting facts regarding food values which the physician may find useful at times to refresh his own memory. A. D. BLACKADER

Public Health Laboratory Work (Chemistry). Henry R. Kenwood, C.M.G., M.B., F.R.S. Eighth edition. 369 pages, illustrations. Price 12/6. H. K. Lewis Co., 136 Gower St., London W.C.1, 1925.

A volume of some three hundred and sixty pages by Henry R. Kenwood, C.M.G., etc., has again taken a place in "Lewis's Practical Series," in the form of its eighth edition.

It cannot be said that medical literature abounds in monographs on this subject, nor is it one which appeals to a very large constituency, comparatively speaking, among the profession, yet by that select group for whom it is more especially written, the work now under review will be welcomed as a decided acquisition. To medical officers of health it will prove to be a very handy manual relating to the practical application of principles and theories concerning every department of their special work. While it should be of definite value to specialists in public health in the larger centres, it should be of inestimable service to all those members of the medical profession throughout the country who assume the guardianship of their respective communities in everything that pertains to health, hygiene and sanitation, but who have not had the advantage of special study and training along the lines of this particular branch of medical science.

The subject as a whole is presented in five parts with "Introductory Notes" covering sixteen pages. These notes describe briefly the structure and use of certain apparatus necessary to the proper equipment of a well appointed public health laboratory. Part I deals comprehensively with the examination of water, the methods of collecting samples from whatever source, its physical characters, whether pure or contaminated, with the peculiar characteristics of the latter; the tests for chlorine in water both qualitative and quantitative, the methods for estimating its hardness and the technique employed in detecting the presence of poisonous metals and of suspended and deposited matter both animate and inanimate; finally closing this part of the subject with an illuminating chapter on the question of how to give an opinion on water samples.

Part II has to do with sewage and sewage effluents, the method of collecting samples for analysis, the technique of the latter and the standards of purity which should be taken as a guide in forming conclusions thereon.

Part III takes up the subject of air analysis and is of interest and value chiefly to medical officers of health in large cities. Methods are described for estimating the amounts of the various constituents of the air and the author points out the practical value of such findings more particularly in regard to carbonic acid and carbon monoxide.

Part IV covers the all important subject of food, including the composition, forms of adulteration and methods of examination of the staple articles of diet, and by its concise and lucid presentation of the facts should commend itself to the general practitioner as well as to the specialist in public health matters.

There are some notes on poisoning by food, alcoholic and other beverages, meat, tinned provisions, etc., and the volume concludes with a brief chapter on disinfectants.

Generously illustrated, the entire work is presented in a very readable and attractive form for such a subject. G. A. ANDERSON

Diseases of the Skin. Catechism Series. J. Ferguson Smith, M.A., M.B. 88 pages. Price 1/6. E. & S. Livingstone, 16 Teviot Place, Edinburgh; The Macmillan Co. of Canada, Toronto, 1926.

There can be no doubt of the teaching value of the catechism method. One can pick out points and emphasize them with force and directness, with greater ease than can be done in the same space by ordinary description. At the same time, however, the student should be always impressed with the fact that it is only one additional aid to clarifying knowledge gained from more varied and detailed sources. With this caution one can readily recommend this number of the catechism series for its clearness and comprehensiveness. The short list of prescriptions given at the end is useful as far as it goes but might gain very considerably by being a little more inclusive; impetigo, for example, might have been assigned a remedy. H. E. MACDERMOT

Frigidity in Woman. Wilhelm Stekel. Translated by James S. Van Teslaar. Vol. I and II. 60 pages. Price $9.00 the set. Boni and Liveright, New York. Canadian Agents: The Macmillan Co. of Canada, Toronto, 1926.

This work, written by Dr. Stekel, a follower of Freud's, shows how frigidity in woman is often the result of psychic disorders of love; and goes on to prove that it can be cured by psychoanalytic methods. Our over-refined culture is said to be the chief influence in causing frigidity, since primitive people seldom display either impotence or frigidity.

An indication of the scope of the work can be obtained by some of the chapter headings—"Love at First Sight, The Sexual Trauma of Adults, Psychology of the Frigid Woman, Infantile Fixations, Psychoanalysis of a Case of Dyspareunia." Throughout the work, numerous illustrations are cited which do much to clarify the means by which these problems, whether comparatively simple or much involved, can be dealt with satisfactorily by psychoanalysis. Although we may disagree radically with many of Dr. Stekel's theories, yet his observations are instructive, and the clinical cases cited, reveal much that is of importance in the prevention of neuroses.

The Art of Medical Treatment. By Francis W. Palfrey, M.D., Visiting Physician, Boston City Hospital; Instructor in Medicine, Harward University. Octavo of 463 pages. Cloth $4.50 net. Philadelphia and London; W. B. Saunders Company; McAinsh & Co., Toronto, 1925.

Dr. Palfrey's book on medical treatment has much about it that is original; it deals not only with the treatment of the patient himself but also gives an insight as to the management of patients' relatives and friends. It is a very good little book on treatment, but leaves some of the more important drugs as they are used to-day without quite so concise a discussion of their therapeutic value as one would expect. For the general practitioner however, this book will be found very valuable and should offer many suggestions that often escape our consideration during the daily routine of work. C. R. GILMOUR

Facts of the Heart. By R. C. Cabot, Professor of medicine and social ethics, Harvard University. 781 pages; illustrated. Price $8.25. McAinsh & Co., Toronto, 1925.

We need more books written from the point of view assumed by Dr. Cabot. Of text-books we have great numbers and also of special monographs dealing with special points, but Dr. Cabot has attempted a different task and one that has its own peculiar advantages—and difficulties.

He has collected and digested the labours of others, as regards both the clinical and pathological aspects of cardio-vascular disease, but his own contributions are also extensive. The method has its risks, but the data collected have been carefully dealt with and conclusions impartially made.

There is something arresting in one of the opening phrases "Most 'Heart Disease' is imaginary." Such statements are in the nature of strong meat, but as soon becomes evident the book is only intended for those who have a good mental digestion, and who have already assimilated the results of not a little experience in disorders of the heart. Dr. Cabot advises "most readers to read the opening and closing chapters and the summaries at the end of each section", and perhaps the caution is a wise one, but this will probably serve only to whet the appetite. The arrangement of the data is particularly good for enabling the reader to pick out special points. A section, for example, is given to the question "Has the size of the mitral orifice any relation to its clinical manifestations" and again, "Reasons for failure to recognize pure mitral stenosis." In his remarks on mitral regurgitation there is an attempted readjustment of our ideas in the light of the pathological material collected. It is one of the commonest of diagnoses, but Dr. Cabot thinks that it is a lesion almost never verified by post mortem. In the 4,000 necropsies of his series but seven cases were found, three of which were "more or less doubtful".

Such a discrepancy can be only explained by faulty diagnosis, arising from the misinterpretation of systolic murmurs, for in spite of the knowledge gained during the war, murmurs are still regarded with more concern than they warrant in themselves. But Dr. Cabot goes further. Stenosis of the mitral valve he admits to be common, but regurgitation rarely occurs, and it cannot as far as he can see, be recognized in life. The classical symptoms of systolic murmur transmitted from the apex, with accentuation of pulmonary second sound, and cardiac enlargement, occurred many times in his series without any post-mortem evidence that the mitral valve was diseased or incompetent. "In most of the cases referred to necropsy showed a hypertrophied and dilated heart, but with a normal mitral valve and no dilation of its ring."

His chief aim in this argument is to show how extremely rare is the condition of mitral regurgitation without stenosis, and he thinks that "for the proper evaluation of national strength in time of war, for the proper education and development of growing boys and girls, for the fair and profitable adjustment of life insurance, and for the happiness and comfort of all concerned, it is essential that we should get this matter straight." One wonders how the statements made by Cabot, if true, were not recognized by previous pathologists and clinicians like Mackenzie and Osler. H. E. MACDERMOT

Operative Cystoscopy. E. Canny Ryall, F.R.C.S. 115 plates containing 670 illustrations, 528 coloured. Price $25.00. Messrs. C. V. Mosby Co., St. Louis; McAinsh & Co., Toronto, 1926.

The author in this very sumptuous volume presents an atlas of one hundred and fifteen plates containing six hundred and seventy original illustrations of which five hundred and twenty-eight are coloured. These include numerous normal as well as pathological views, drawings and radiograms of the urinary tract with brief but clear descriptions of each.

The coloured plates represent almost every type of lesion seen by the cystoscope, besides many instructive drawings of their operative cystoscopic treatment. All are beautifully done and place the whole subject before the student much more clearly than would be possible with descriptive reading, or indeed, with months of clinical work. D. W. MACKENZIE

Clinical Disorders of the Heart Beat. A Handbook for Practitioners and Students. By Sir Thomas Lewis, M.D., F.R.S., D.Sc., F.R.C.P., C.B.E. 131 pages, illustrated. Sixth edition. Price 8/6 net. London: Shaw & Sons, Ltd., 1925.

All those who are familiar with this monograph will welcome its sixth edition. In general outline it is similar to the previous ones; but, there have been incorporated the important newer conceptions which underlie the production of cardiac irregularities. It is a book that should be in the hands of every practitioner and teacher. Its simple and lucid description and interpretation of the usual disorders of the heart make it an important volume for ready reference.

The conception demonstrated by the author and his co-workers that auricular flutter and auricular fibrillation were due to a circus movement of the

auricle, has gone far to make these very common but yet etiologically obscure cardiac diseases quite easily comprehended, and has laid a foundation for their rational treatment. J. C. MEAKINS

Uterine Hæmorrhage. Samuel J. Cameron, M.B., F.R.F.P., S.G., and John Hewitt, M.B. 208 pages. Price 8/6 net. Messrs. Edward Arnold & Co., London, W., 1926.

Conditions giving rise to hæmorrhage from the vagina are dealt with in a well arranged book of some two hundred pages. The information given is well adapted to the practitioner treating cases where elaborate laboratory tests are not at hand for differential diagnosis, and where the simplest and most effective treatment only is obtainable.

In an appendix the symptoms arising from shock and hæmorrhage are described and differentiated. Appropriate treatment for both is recommended. The technique for blood grouping and blood transfusion is clearly and concisely given.

The book reflects the ripe experience of the author, and presents to the reader well tested methods for the practitioner to employ in the diagnosis and treatment of uterine hæmorrhage. It is recommended to the profession. A. D. CAMPBELL

International Clinics. Edited by Henry W. Cattell, A.M., M.D., and others. Vol. I, 36th Series. Price $2.50 for one volume, $10.00 for the set of four. J. B. Lippincott Co., 201 Unity Bldg., Montreal, 1926.

In this number we note the high standard of papers which the "International Clinics" has always maintained. Under the title of "The Sequelæ of Diphtheria" Dr. H. B. Cushing of Montreal writes in a delightfully concise manner of a disease which he says "has no license for existing or for having a death-rate. Dr. Astley Ashhurst, of Philadelphia, publishes a paper on the "Motions of the Larger Joints", which is well and freely illustrated. Dr. Norman Gwyn, of Toronto, contributes a thoroughly comprehensive and satisfying review of "Massive Collapse of the Lungs". The number also contains condensed but complete reviews detailing the progress in medicine and surgery during 1925.

H. E. MACDERMOT

Medical Diagnosis for the Student and Practitioner. Charles Lyman Greene, M.D. 1468 pages, 713 illustrations. Sixth edition. Price $12.00. P. Blakiston's Son & Co., Philadelphia, 1926.

One supposes that text-books on medical diagnosis will continue to be written because (or even though) diagnosis is obviously so very difficult a thing to impart by *any* method of teaching, let alone the text-book. Hence it is that one opens a book on medical diagnosis with the curiosity of the seeker after an ideal, and hence it also is that the search is never at an end. As regards the work under review, it is something to say that it has reached its sixth edition, and further it is clear no pains have been spared to produce a volume which shall be at once concise and complete. The method of employing short paragraphs is convenient for emphasizing points, although the frequency with which italics are used is apt to take away some of the effect. There is an abundance of good illustrations, but some of the x-ray plates are disappointing. We note the combination of the symptom and general index, which makes for convenience of reference.

The inclusion, or not, of new theories and tests will always be a difficult question in text-books but we think that mention might have been made in the section on Infection and Immunity, of d'Herelle's phenomenon. We must add to this criticism, however, that this particular section is written with admirable clearness and conciseness. In the estimation of liver function, it is unfortunate that the Van den Bergh test receives no mention.

One further small point for criticism is to be found in the description of Quincke's disease, it is referred to as being primary idiopathic hydrocephalus, without any mention of the term being also used as an alternative name for angioneurotic œdema.

H. E. MACDERMOT

Observations on the Habits of Ants.—In the current number of the *Deutsche medizinische Wochenschrift,* Privatdozent Dr. Eidmann has an article on "psychic" or "mental" qualities of ants. In order to study the "language" of ants, Eidmann constructed a large upright ant-nest of plaster of paris, which was provided with glass walls, through which, as in a beehive, a large captured colony of *Myrica rubra* (a common species in Germany) could be carefully observed and all the details of intercommunication noted. If one puts a bit of food—for instance, a dead insect—in the vicinity of the ant-nest, only a short time will usually elapse before one of the workers ranging about, a "scout," will discover the booty. The worker, having convinced herself through the application of the antenna of the genuineness of the find, drags it off in the direction of the nest, where it is received and disposed of. But, if the scout is unable unassisted to manage her find, she returns to the nest to sound an alarm. Her mode of operation, on reaching the nest, is to run about in an excited manner, crossing antennæ with all the comrades she chances to meet. The ants thus informed of the scout's discovery scurry forth in quest of the prize. In a short time, sufficient aid has assembled to accomplish the task of carrying the booty back to a place of safety.

To test the ant's sense of duty, the observer placed an enticing morsel, a bit of honey, in the path that was being worn between the dead insect and the nest. Tarrying only for a moment to take a sip of the honey, the ants continued their work, and did not consume the honey until their appointed task was completed.

The ant queen is enabled after impregnation

to found a new colony unaided. This mode of colonization is referred to as being autonomous. Eidmann observed the autonomous method of colonization among our largest species, *Camponotus ligniperdus* Latr. He carefully placed a pregnant female in a small three-chambered, upright nest, made of plaster of paris. Here the queen shut herself off from the outer world by stopping the entrance to the lower darkened chambers of the nest with a wad of cotton. After a short time, she laid a bundle of fourteen eggs, from which the larvæ were hatched. May 29, the first worker came forth. The nest was kept moist but up to this time, the queen had not partaken of food. Nevertheless, she had been able not only to satisfy the metabolic exchange of her own body but to raise a whole group of larvæ. The queen was compelled to take the entire food consumption that she and her brood required from the reserves of her own body.

For the observation of the dependent form of colonization, Eidmann placed a fertile female of *Formica sanguinea* Latr. in a large nest that contained a small colony of *Formica fusca* L., the common slave-ants consisting of twenty workers and 100 pupæ. After a short time spent in reconnoitering, the queen pressed forward into the lower chambers of the nest where the *fusca* workers were and where the pupæ were stacked up. She incited the first worker she met to combat, and retreated to the upper chamber, followed by the enraged worker. Here she turned on the worker and promptly bit her to death. Immediately the queen rushed back into the lower chambers to renew the combat, and pursuing the same tactics had soon killed the superior force. From the pupæ that the queen now had in her possession, a large number of *fusca* workers developed, became her willing slaves, and assisted her in raising her own brood.—Berlin Correspondence, *Jour. Am. Med. Ass.*, March 27, 1926

The Influence of Fatigue on Infection.—A. E. Boycott and C. Price-Jones (*Journ. Path. and Bact.*, January, 1926, p. 87) have investigated the generally accepted belief that fatigue predisposes to infection. Rats were exercised in drums which were rotated quickly so as to cause them considerable difficulty in maintaining their equilibrium. There was a fall in the rectal temperature roughly corresponding to the degree of fatigue. Both the fall in the temperature and the onset of fatigue were slower in rats exercised at a temperature of 25° to 30° C. than at one of 4° C. In the first series of experiments ten batches of rats after exercise were injected intraperitoneally with Gaertner's bacillus; another eleven batches were first injected and then fatigued, the exercise being repeated on the next and sometimes on the following days. A similar number of control animals in each case were injected but not fatigued. The mortality among the exercised and the control animals was closely similar, indicating that fatigue did not lower the resistance to infection. In another series of experiments the rats were fed on Gaertner's bacillus, fatigued daily for several days, and killed after about a fortnight. The results were unexpected. Of 27 exercised rats 24 became ill and 13 died; of 28 non-exercised rats fed with the bacillus only one showed slight symptoms of illness and not one died. Fatigue after infection increased both the morbidity and the mortality, but this result did not seem to be due to the ease with which the bacilli penetrated the alimentary mucosa, since in both the exercised and the control animals the bacillus was recovered from the spleens of about 90 per cent of the survivors.—*Brit. Med. Jour.*, Feb. 13, 1926.